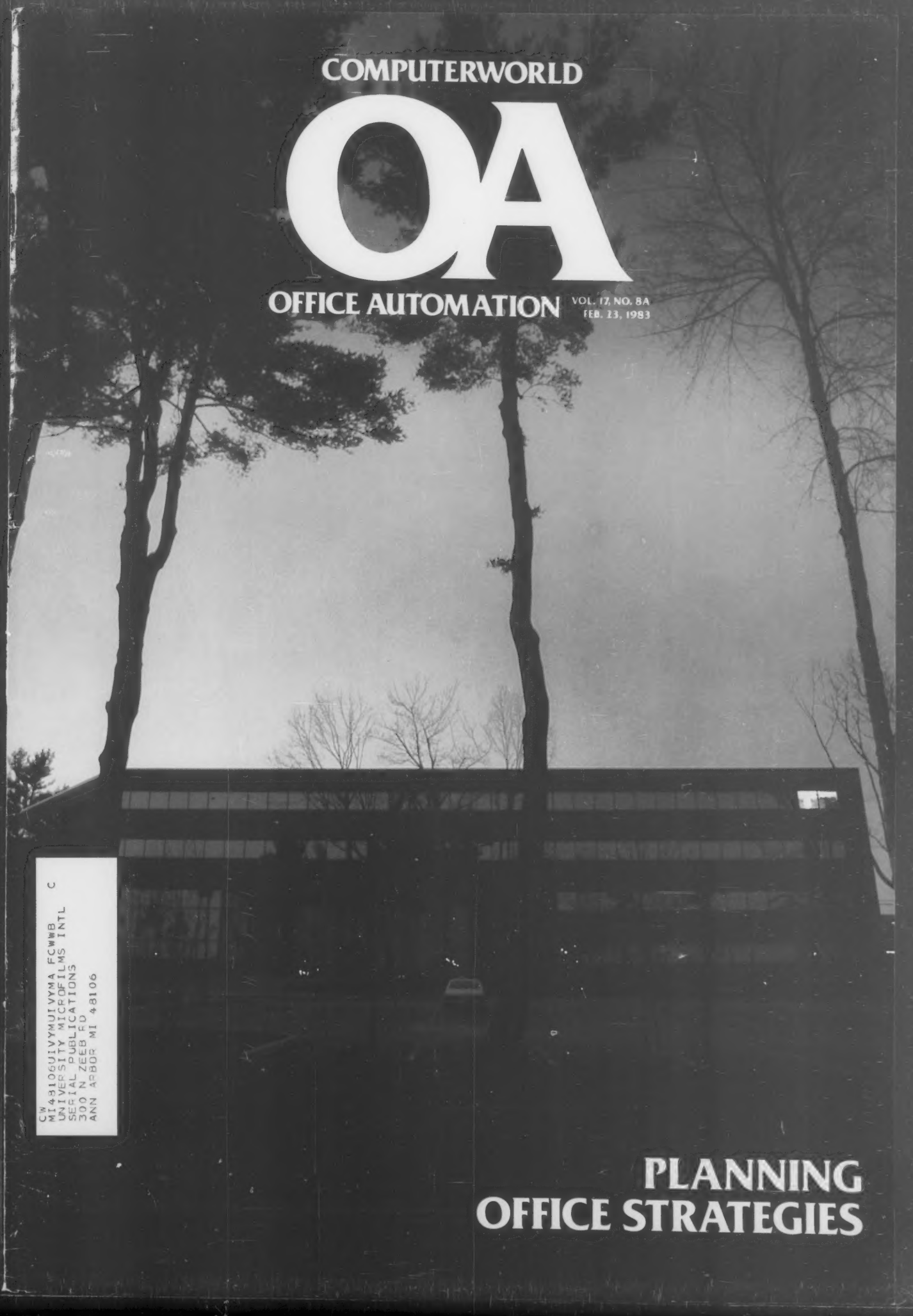

COMPUTERWORLD

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OFFICE AUTOMATION

VOL. 17, NO. 8A
FEB. 23, 1983

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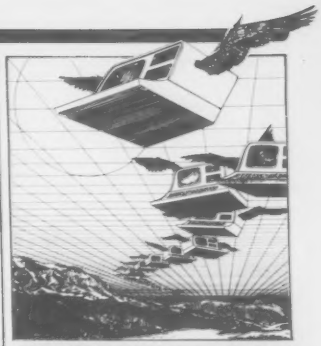
CONTENTS



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COMPUTERWORLD

OA

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COMMENT

It's a sad comment on the industry that users consider it an event when a computer is easy to use. It is not a criticism of Apple Computer, Inc.'s new Lisa personal computer to point out that most of the acclaim centered around its ease of use, not its applications technology.

Users should not have to feel grateful when a vendor offers a feature that should be a given. Similarly, businesses should not be put in the position of paying money for technology that strikes fear in the hearts of their secretaries as well as their chief executive officers. Apple made its mark catering to the "techie," yet it is one of the first vendors to concentrate on the user interface for the non-DP user. Other vendors should sit up and take notice. Vendors see the office market as ripe for picking. To date, however, many products they are offering — while adequate for a hard-core DPer — are difficult for non-DP users to learn and use. In many cases, novice users are being forced to sit at keyboards and type commands that are frequently incomprehensible and hard to remember. If the user wants to change from one application to another, he must stop work to change disks.

"Businesses should not be put in the position of paying money for technology that strikes fear in the hearts of their secretaries as well as their chief executive officers."

Unlike the computer aficionados, this audience is not interested in the technology per se, but only in what it can do. Can it improve organizational efficiency? Can it make the user's job easier? It doesn't matter how efficient a machine can make an organization in theory if users cannot be productive in practice.

The responsibility does not lie solely with vendors, however. Too many organizations perceive office automation as a quick-fix solution to their problems. Rather than analyze needs, work flow, employee working habits and working conditions, companies all too often plunk equipment on their employees' crowded desks or typewriter tables and then expect them to start being more productive. In the short term, it may be the employees who suffer; ultimately, it is the organization that gains nothing — and sometimes it loses a lot.

If OA is to make business more efficient and employees more productive, vendors will have to start at the beginning: making their equipment more efficient for end users. And implementors will have to realize equipment alone won't work miracles. Understanding user needs is the first step toward a successful technology.

LETTERS

More School Days

I found the article "School Days" [CWOA, Dec. 1, 1982] by Patricia Carrell to be most interesting. I have been involved in the training of WP secretaries and operators and have various viewpoints I would like to share with you.

"I want to learn word processing." This is a familiar refrain to many of us who have been in the field for years and are witnessing this upsurge in popularity of WP. The shift in training from vendors to other sources has given birth to a greater need to create training programs to meet this growing demand. This emergence of many training programs has created an open market for exploitation.

Word processing originally started as a concept and/or innovative system idea of office procedures. However, it is currently known to the layman as "those wonderful machines." The average individual is excited at the prospect of receiving high monetary rewards — which we know come only with experience. Not knowing what to look for in a training program, one goes to the one that is the quickest and least expensive — not necessarily the best.

The criteria for a good training program should include answers to the following questions:

- What other knowledge and skills does the training program offer? Does it offer English and communication skills, concepts and typing speed?
- How many machines do they have for instructional purposes? The answer will determine how much actual hands-on time the individual receives.
- What type of equipment is taught? Does the program cover microprocessors or word processors? Although in theory, storing and retrieving might be the same, practicality and keyboard language differ. Does the system offer transferable skills, or is it only through the use of a software program? Does the program keep up to date with current technology?
- What is the location of the equipment? Is it on the premises or off? Is the student learning and working for a company at the expense of the individual and the outside company?
- How is the use of the equipment taught? Is the atmosphere of the laboratory conducive to learning? Is there an instructor teaching on an individual basis or is it just tape instruction? What is the background of the instructor or the program coordinator? Does the program teach operator independence and the ability to troubleshoot?

A company looking for a knowledgeable operator should check to see that the training program provided the best instruction it could possibly offer. I agree with the point made in your article that proper facilities, manuals and assistance are all necessary parts of good training.

In-house instructors must learn to deal with the human aspects of training. Each student experiences a basic fear of learning, a loss of control, when he sits down at any system. Wherever the training takes place, whether in a vocational school or on the job, the student must feel at ease with the system. This is especially true of students who lack experience with system language and usage.

In most cases, I have found it necessary to implement my own training tools, such as technical and exercise manuals, visual aids and so on. It has been my experience that vendor-supplied material has not been geared toward the student and seems to assume a certain level of system knowledge. If training is to be geared toward the entry-level employee who does not have any system knowledge or experience, no knowledge should be assumed.

A properly trained operator is one who will need instruction only in the company's procedures and organization, not in the skills that should have been part of the training process itself.

Naomi R. Glaser
WP Training Director
American Business Institute
Of Brooklyn
Brooklyn, N.Y.

To Our Readers

Current *Computerworld* subscribers will continue to receive *Computerworld OA* this year as part of their subscription. Other readers who want to continue receiving the publication should subscribe to CW, using the bound-in envelope and subscription form located elsewhere in this issue.

We encourage readers to let us know their opinions, suggestions, problems and news of technological breakthroughs. Letters should be addressed to The Editor, Computerworld OA, 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701

READER FORUM

By Michael Goldman

It hasn't been a bed of roses . . . Oh, I wouldn't want to be without office automation. I still cringe when I visit other companies and watch secretaries type or managers file away daily tomes. But the transition hasn't been without its problems. Every office has its kinks, but an automated one can sometimes be like giving your teenage son your Porsche to go pick up girls: He's either going to get to old problems faster or amaze you with creative new ones.

Because of these new tools I have been called creative, responsive, overbearing, unavailable, too available, inhuman, warm and (my favorite) "still a technician at heart."

How did it all happen? A little at a time. Once my tube was installed, I felt it gave me license to make innovative changes to office operations. After five years, I have learned to categorize the nuances by their respective technology:

Electronic mail: Our system provides a function that allows follow-up answers to a user who has read an electronic note. This has resulted in a new language, which I refer to as "Replyspeak" — somewhat appropriate, when you consider the Orwellian effect of this environment. It works like this: Suppose you send a note to one of your peers to inform him of your correct phone number:

Me: It's X2476. Mike.

This is when Replyspeak kicks in.

Peer: Thank you.
Me: You're welcome.
Peer: Appreciated.
Me: It was nothing.
Peer: Really clears things up.
Me: Glad to have been of service.
Peer: And you were prompt too.
Me: You know me — everything on time
Peer: Oh yeah, what about the Freebish Project????

Including punctuation, the original message was 14 characters. But the net effect is that my coworker might as well forget my number, because I will now be out to him for the next three months.

When Replyspeak mixes with the "buck slip" function, life can get even more difficult. After I requested the installation of two telephones, I was sent a reply that they would be too costly and my request was denied. The message, from a building management clerk, came late in a particularly tough day. (At least that was an excuse I included in my follow-up apology.) Deciding it was time to flex my organizational muscle, I replied in capital letters, with no sentence greater than three words and with an excess of exclamation points.

Within microseconds, my message went from the clerk to her boss to my boss. I received a brand new note from the big guy. The last note was read on Saturday morning on my at-home terminal. I spent the rest of the weekend discussing with my wife the virtues of my becoming a househusband.

By the way, after forwarding a note of apology (long sentences, all in lowercase) describing to the clerk the pressures of a high-exposure job, two things happened. One, I got my phones and two, I am now known as the e.e. cummings of Replyspeak.

Decision support: I am genuinely amazed at the numerous ways I can alienate my secretary. At budget time no one likes anyone anyway. Budgets aren't difficult, but every number changed requires rows and columns to be added again. To request more than one change a day is to tread on dangerously thin ice.

I resolved that this year would be different! With the old programmer's blood rushing through my veins, in a few hours I created a budget data base and support software to produce extensive reports. All that was left was the data entry portion.

Once again I proved that, while programmers are born not made, analysts had better be the parents. The system was not ergonomically sound, user-friendly nor human engineered. After a few days and changes, my secretary felt very comfortable working with the data base. However, when I persisted in making changes before she did (and without telling her) I received notes from her — all in capitals, with no sentence longer than three words.

The machine that answers the phone: Through intense study, I have determined that people who dial only four digits expect to find a human being on the other end of the phone. Seven-digit people leave messages, but in-house people normally swear and hang up.

My department was clearly considered pretentious when I okayed the installation of this handy device. Once every hour we would dump the tape and find seven receiver clicks for every message left. Actually, this ratio points out a productivity gain. If it wasn't important enough to leave word, why was the call made? With this in mind, I would chuckle as people stopped me in the hall to tell me how much they hated that thing in my office.

Of course, some small problems did occur. Like the time I was traveling and needed to talk to one of my managers and all I got was that damn recording. (Now, when I go on trips, if I can't call early in the morning or right after lunch, I don't call at all.) There was also the time we forgot to dump the tape for three hours; the first message on it was from the security desk telling me that my guests had arrived, were seated in the lobby and I should send someone to get them.

Graphics: A picture is worth a thousand words. Not only was a terrific graphics device installed, but it has a 35mm camera attached to it. Presentations could now take on the characteristics of media events. No discussion was too small — all would be embellished with word slides and multicolored graphics representing the rise in waste paper baskets emptied or incompleted phone calls left on my answering service. I am now greeted in meetings with the same groans I get at home when I pull out pictures of my vacation.

Moreover, because we are a company with 3,000 employees and only three slide projectors, the following scenario is common: "And now, if you will hold up the third slide to the light, you will see profits have increased while we have maintained a level number of telephone operators."

Word processing: Doing my own typing seemed like a real commitment to the advanced office. For years I plodded along, writing things out in long hand, then turning the whole cryptic mess over for typing. Not now. Now my ignorance of spelling, punctuation and verb tense are clearly displayed to all who receive my documents. I have since moved on to dictating equipment, which leaves my secretary to deal only with unfinished thoughts. As a result, my "writing" vocabulary has increased — I can now use words that in the past I found unspellable.

Interestingly, though, I still use word processing to type out sensitive memos. This way, memos of a confidential nature are neatly presented without involving typists and over-the-shoulder readers. Usually. There was the time, however, when as a catharsis I used a document to record my solution for all of the world's problems. The piece was rather lengthy and was written late at night. When I arrived at work the next morning, an apologetic office consultant informed me that one of my documents had been inadvertently overlaid, but they would strive to get it back for me. The rest of the day was spent with my telling them to forget it while the OA staff insisted that the only honorable thing to do was to restore it.

A consultant did get it restored and pledged she never read anything she brought back from the bit bucket. She also laughs a lot when she sees me now.

Other strange phenomena continue to occur. In spite of all these trials and birth pains, however, I still wouldn't trade my two terminals (one in the office, one at home) for the old ways. The value-added carried throughout this system far outweighs the occasional creative and innovative mistake. Secretaries complain about response time and executives wish that our financial packages could do just a little more. But they all agree life in the advanced office is more productive and satisfying — and even more fun. In the words of the famous philosopher A. Schwartzenegger, "No pain — no gain." OA

Goldman is the second vice-president and director of communications and information analysis at Lincoln National Corp.

NEWSBRIEFS

LOWELL, MASS. — DR. AN WANG, FOUNDER OF WANG LABORATORIES, INC., HAS APPOINTED JOHN F. CUNNINGHAM, FORMER EXECUTIVE VICE-PRESIDENT, AS HIS REPLACEMENT AS COMPANY PRESIDENT AND CHIEF OPERATING OFFICER. Wang will remain as chairman of the board and chief executive officer. Harry H.S. Chou, formerly executive vice-president, was promoted to vice-chairman of the board and will remain as chief financial officer and treasurer. Frederick A. Wang, Dr. Wang's son and formerly senior vice-president, was promoted to executive vice-president and chief development officer.

ARLINGTON, VA. — THE SITE OF THE 1984 NATIONAL COMPUTER CONFERENCE (NCC) HAS BEEN CHANGED FROM ITS HOUSTON LOCATION TO EITHER THE LAS VEGAS CONVENTION CENTER OR McCORMICK PLACE IN CHICAGO. The decision was made by the American Federation of Information Processing Societies, Inc. (Afips) after that organization received numerous complaints from vendors and attendees about inadequate facilities and accommodations. The 1983 NCC will be held May 16-19 in Anaheim, Calif., as planned.

PALO ALTO, CALIF. — THIRTEEN ELECTRONICS COMPANIES HAVE ENDORSED A SINGLE EMERGING STANDARD FOR LOCAL-AREA NETWORKS which will eventually allow computers and office equipment, regardless of brand, to communicate with each other. The new Institute of Electrical and Electronics Engineers (IEEE) P802.3 draft standard, Carrier Sense Multiple Access with Collision Detection (CSMA/CD), represents the convergence of IEEE 802 working drafts, Ethernet specifications and documents from the European Computer Manufacturers Association.

WILLOW GROVE, PA. — THE EXECUTIVE BOARD OF THE INTERNATIONAL INFORMATION/WORD PROCESSING ASSOCIATION (IWP) RECENTLY VOTED TO CHANGE THE ORGANIZATION'S NAME to the Association of Information Systems Professionals (Aisp). The name change is effective June 1, 1983, as part of an overall strategic five-year plan. The new name is intended to be a more accurate reflection of the professional expertise and aspirations of the group's membership as a whole. The association's purpose is to serve as the representative organization for users of information systems products and services and will "express the needs of those who design, implement, manage and use all information systems."

NORWALK, CONN. — THE SURGE IN BUSINESS/ PERSONAL COMPUTER REVENUES IS EXPECTED TO REACH ITS PEAK AND TAPER OFF TO EXTREMELY MODEST LEVELS BY 1992, according to a report by International Resource Development, Inc. (IRD). The 163-page document, "Vendor Strategies for Personal Computers/Workstations," predicts that by 1987 the personal computer market will begin to be absorbed by the multifunction workstation field. This workstation market will garner roughly $14 billion annually during the next 10 years, according to the study, with the workstation destined to "serve as a replacement for data terminals, word processors and personal computers, which will either become obsolete or move downward in the white-collar hierarchy." IRD is at 30 High St., Norwalk, Conn. 06851.

SILVER SPRING, MD. — THE NATIONAL MICROGRAPHICS ASSOCIATION (NMA) BOARD OF DIRECTORS WILL BALLOT ITS MEMBERSHIP FOR THE PURPOSE OF CHANGING THE GROUP'S NAME to the Association for Information and Image Management. At a recent meeting, the board concluded that the NMA must broaden its scope and promote micrographics as an integral part of the automated office and not remain as a stand-alone technology. The new name would be officially adopted on July 1, 1983, pending voter approval.

NEW YORK — THE WORLDWIDE VIDEOTEX/TELETEXT MARKET IS GROWING IN EXCESS OF 100% ANNUALLY, according to a recent study published by Link Resources, Inc. The report, "Worldwide Videotex/Teletext Evaluation," also concluded that on a global basis, Prestel-formatted systems still dominate the marketplace, with half of the public systems using Prestel-based coding schemes.

In computer hardware, half of all survey participants reported using Digital Equipment Corp. host machines. Banks were revealed to be the largest category of information providers in the world's videotex community.

FORT WORTH, TEXAS — TANDY CORP. WILL ACQUIRE THE ASSETS OF INTERCONNECT TELECOMMUNICATIONS SYSTEMS, INC. (ITS) OF LEXINGTON, KY., FOR AN UNDISCLOSED CASH SUM. It will reportedly be incorporated into the Radio Shack division of Tandy to broaden the scope of its tele-

NEWSBRIEFS

phone product marketing. Radio Shack intends to open a series of experimental retail telephone stores in conjunction with its acquisition.

LOWELL, MASS. — WANG LABORATORIES, INC. HAS REACHED AN AGREEMENT IN PRINCIPLE WITH UNITED STATES SATELLITE SYSTEMS, INC. (Usssi) which calls for Wang to acquire both a minority ownership in and satellite transponder capabilities from Usssi. As a result, Wang's major accounts will reportedly be able to own or participate in their own national communications networks of Wang-based systems, complete with voice, data, video and text transmission capabilities. Under the agreement, Wang may purchase additional bandwidth from the New York-based Usssi in the future.

SCOTTS VALLEY, CALIF. — VICTOR TECHNOLOGIES, INC. ANNOUNCED THAT ITS PERSONAL COMPUTER HAS BEEN SELECTED BY FORD MOTOR CO. FOR USE THROUGHOUT THE CORPORATION. Ford is expected to purchase 1,500 to 3,000 Victor 9000 systems, most of which will go to Ford's Dearborn, Mich., headquarters. The Victor product has a single-unit base price of $3,995.

WELLESLEY, MASS. — THE PORTABLE BRIEFCASE COMPUTER AND TERMINAL INDUSTRY, WITH SHIPMENTS OF 265,000 UNITS IN 1982, WILL INCREASE SHIPMENT VOLUME 12 TIMES OVER THE NEXT FIVE YEARS, according to a study by Venture Development Corp. The fastest growing area in this industry, which encompasses portable display terminals, portable teleprinters and portable computers, is the rapidly emerging portable briefcase segment. This market is led by Osborne Computer Corp., which boasts a whopping 56.1% share of 1982 revenues. Venture is at One Washington St., Wellesley, Mass. 02181.

CINCINNATI — THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH) WILL EXAMINE THE RELATIONSHIP BETWEEN VIDEO DISPLAY TERMINALS AND PROBLEM PREGNANCIES AND BIRTH DEFECTS. The study has been prompted by a growing concern among women office workers. A team of Niosh researchers, led by Dr. Michael Rosenberg, will compare the rate of spontaneous abortions and birth defects among users and nonusers. The study will be the first large-scale epidemiological research that focuses on women using the terminals and will draw from records on 6,000 pregnancies.

PHILADELPHIA — THE FRANKLIN RESEARCH CENTER HAS ANNOUNCED THE DEVELOPMENT OF AN OFFICE OF THE FUTURE PLANNING MODEL to assist in evaluating the impact of OA technology on the productivity and lifestyle of professional and office employees. The computer model project, called Optimus, is a multiclient-sponsored venture that will reportedly help companies forecast and analyze the expense of equipment, software, training and facilities necessary to achieve OA objectives. The institute is at 20th and Race Station, Philadelphia, Pa. 19103.

WASHINGTON, D.C. — A MICROCOMPUTER SELECTION GUIDE FEATURING THE CHARACTERISTICS OF 47 MAJOR MICROCOMPUTERS HAS BEEN COMPILED here by the Office Automation Society, Inc. (Oasi). The reference guide reportedly includes information on word processors and various OA products, with charts, definitions and checklists to help match specific office needs. It costs $24 from Oasi through P.O. Box 31, Washington, D.C. 20044.

NORWALK, CONN. — RESTRUCTURING OF THE TELECOMMUNICATIONS INDUSTRY WILL RESULT IN "CONVULSIVE" CHANGES IN THE MARKET FOR TELECOMMUNICATIONS EQUIPMENT LEASING SERVICES, according to a research report from International Resource Development, Inc. (IRD) The study analyzes the expected impact of the AT&T Consent Decree and the Federal Communications Commission's Second Computer Inquiry decision and reviews the opportunities in telecommunications leasing for lessors, commercial banks, telephone companies and equipment manufacturers.

The report points out that leasing companies are already jumping into the telecommunications market, ready to displace some of the telephone companies' traditional leasing activity. IRD is at 20 High St., Norwalk, Conn. 06851.

HOUSTON — COMPAQ COMPUTER CORP. HAS ANNOUNCED THAT THE SEARS BUSINESS SYSTEMS CENTER CHAIN AND 10 OTHER COMPUTER RETAIL STORES WILL NOW SELL ITS COMPAQ PORTABLE COMPUTER. The 16-bit portable machine, intended for business and professional use, is reportedly plug-compatible with the IBM Personal Computer and its software.

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Who Controls The OA Budget?

OA is predicted to skyrocket during the next decade. Finding out how others spend their money may help you budget more wisely.

By Thomas Elliott

With total U.S. office automation equipment sales topping $7 billion in 1982, somebody is obviously spending a lot of money on OA. And with revenue growth rates in the double digits for most OA vendors, users are apparently spending much more each year than they did the previous year. However, to go beyond these clear, unassailable, but not terribly useful statements is to enter a realm of conjecture.

Who is spending how much on what? Who decides what gets acquired and what doesn't? Does anybody keep track of OA expenditures in most organizations? If so, who? Is there an OA budgeting process? Is it different from other forms of budgeting and control, or is buying a word processor like buying a turret lathe? Do different industries and sizes of organizations handle OA budgeting and control differently?

Answers to questions like these would draw a much more complete picture of the OA business, useful not only to vendors seeking to understand their markets better, but also to users looking for ways to manage OA better. For the past two years, International Data Corp. (IDC) has been looking at the organizational aspects of OA and has recently completed an OA user spending study of 300 organizations. The study illuminates some of the critical budget and control questions.

In general, we found that a few common organizational patterns are developing in OA management, and they are consistent across industry and, to a lesser degree, across organizational size ranges. OA management responsibility usually includes

at least keeping track of OA expenditures, although the actual authority for expenditure tends to be shared between OA management and the ultimate end-user department. As for actual spending levels, we found that budget expenditures were increasing in the organizations we surveyed. However, for a variety of reasons, ranging from the economy to cost-justification issues, percentage increases for 1983 vs. 1982 would be lower than 1982 vs. 1981 increases.

OA is a convenient term, but it is not a terribly specific one. There is a general consensus about what is probably included when the term is used, but no definition exists that cannot be proven inadequate. This degree of certainty is scarcely one to give comfort to accountants talking about budgeting and control. For this reason, after establishing the size and industry of the responding organization, we asked as our first item on our user spending survey what kinds of hardware and software were included in OA for the purposes of budgeting and control.

As might be expected, word processors were the single piece of equipment most frequently included, followed by WP done on mainframe computers. Of 325 survey respondents, 289 and 200, respectively, indicated inclusion of these two products. Desktop computers made a strong showing, with 177 responses, suggesting that in many organizations desktops are being considered as something more than simple extensions of data processing. Interestingly enough, in light of the attention being paid to voice/data integration in the OA literature, only 86 respondents indicated that any form of voice communication was included in OA budgeting.

Patterns of product inclusion in OA differed between smaller organizations and larger organizations. No major differences appeared in the rate at which respondents included desktop computers and word processing on either a dedicated or a mainframe application level. Larger organizations, however, were more apt to include electronic mail and multifunction office systems in OA than were smaller firms. This is understandable, since electronic mail is likely to be more useful in large organizations than in small ones, and multifunction office systems may be more attractive to larger organizations with some financial room to experiment with new technologies.

The nature of OA, in particular this lack of clarity about what should and should not be included, raises some critical issues for financial management of the OA effort. Some OA technologies, like desktop computers, are inherently decentralizing; they continue well-established DP trends toward moving processing power to the end user. Similarly, convenience copiers can be seen as moving copying power away from central reprographics. Other technologies, like electronic typewriters and stand-alone word processors, may be seen as simply new versions of existing office technologies over which there has historically been little central organizational control.

"Strongly decentralized organizations tend to have budgeting and control systems very different from those of centralized organizations."

Technologies like electronic mail, however, have some centralizing influence because they frequently cross organizational boundaries and involve central resources. To the extent that OA continues to move toward intersystem communications, organizationwide networking and the sharing of organizational data bases, this centralizing tendency will strengthen.

Strongly decentralized organizations tend to have budgeting and control systems very different from those of centralized organizations. Spending authority is delegated further down and out on the organization chart, review

procedures focus less on line item details and more on net results and so on. Therefore, the nature of OA in any given organization determines what approach is reasonable for budgeting and control of OA expenditures. If OA consists purely of word processing on a departmental level, then a heavily centralized structure may be inappropriate. If, however, a multisite, multidivision company is interested in electronic mail, then some degree of central control makes a lot more sense.

Managing OA, of course, includes a number of responsibilities that do not bear directly on the budgeting and control of OA expenditures, such as technical equipment evaluation, training programs and top management education. However, much of OA management — like much of management in general — comes down to how funds are controlled.

IDC has been looking at management structures for OA in a number of different surveys and interview programs, including the recent one on user spending. In spite of a great deal of diversity in how organizations approach the management of OA, some common tendencies seem to be emerging.

"The majority of organizations with any involvement at all in OA have appointed an individual or committee with some degree of management responsibility for OA throughout the organization. In many cases, the appointment was fairly recent."

The majority of organizations with any involvement at all in OA have appointed an individual or a committee with some degree of management responsibility for OA throughout the organization. In many cases the appointment was fairly recent: In two surveys published in 1981, between a third and a half of the individuals and committees had been appointed within the past year.

In the recent user spending survey, respondents again indicated overwhelmingly (70%) that there were individuals or committees with organizationwide OA responsibilities. Larger organizations seemed significantly more likely than smaller ones to have made such an appointment. Of those indicating an organizational revenue or budget of less than $25 million (18% of the sample), only 63% had designated OA responsibility, as opposed to 77% of the organizations over $1 billion (17% of the sample).

There seems to be a clear trend to locate OA responsibility within the DP or management information services (MIS) function. In one earlier study, over half the individuals who indicated they had OA responsibility also had DP/MIS backgrounds; in the user spending survey, about two-thirds of the 325 respondents indicated OA was a management responsibility of the DP or MIS department. Larger organizations and organizations spending a relatively large amount on OA were more likely to allocate responsibility this way.

"Having responsibility" for OA obviously covers a lot of ground. To ascertain exactly what is meant by that term, previous surveys have posed a series of more specific questions, such as:

Does responsibility include planning, financing and implementing pilot projects? Does it include acting as sole OA purchasing authority?

Generally speaking, the results have suggested that OA responsibility tends to be more persuasive than coercive. For example, more respondents indicated responsibility for monitoring OA expenditures than for controlling them.

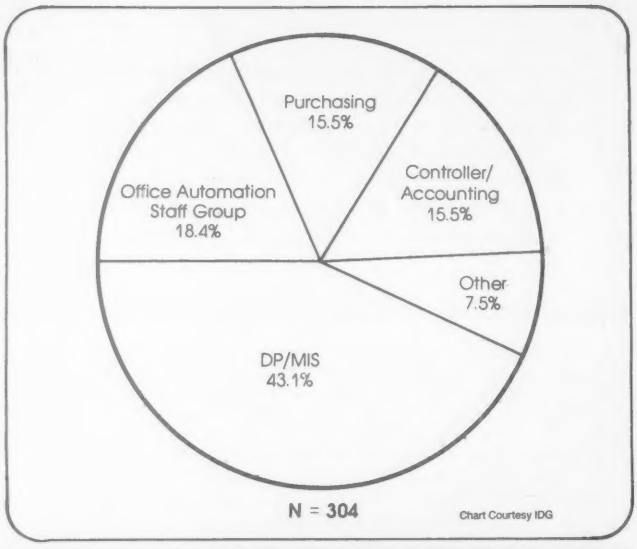
In the user spending survey, 208 respondents indicated that monitoring expenditures was part of the responsibility of OA management, but a significant number (135) indicated monitoring responsibility was shared among one or more different departments or individuals in addition to the primary OA management individual or group. As might be expected, controller or accounting departments were most frequently mentioned as sharing responsibility (39%), followed by DP/MIS and purchasing, with 21% and

19% respectively. (Considering the centrality that purchasing departments have historically had with office equipment expenditures, the relative infrequency of their mention is interesting.)

Having designated responsibility for OA, even including monitoring expenditures, does not appear to be the same as having a comprehensive OA plan. Respondents to the user spending survey were asked if there was an organizationwide plan for OA and, if so, whether it included a formal budget or spending plan. Less than half indicated that their organizations had a plan, although about two-thirds of those who did said it included a budget. There seemed to be no correlation between the size of the organization and the likelihood of having an OA plan, although — not surprisingly — organizations with larger OA expenditures were more likely to have one.

Procedures by which funds are allocated and expended for OA equipment acquisition vary slightly from organization to organization, but they don't appear to be too different from any other sort of capital allocation process. In fact, in response to the statement "OA equipment budgeting is essentially like all other capital budgeting," almost 60% of the user spending sample agreed this was "a very good description of our process." (Only about 5% indicated it was "definitely unlike our process.") Furthermore, more than 80% of the respondents indicated that the spending authority limits of managers were the same for OA equipment as for other types of spending.

Given the level of interest in cost-justification of OA, we decided to ask if cost-justification was a required part of all OA equipment proposals. Almost three-quarters of the respondents replied that this was at least partially the rule in their organizations. However, slightly less than a third said it was usual for follow-up studies to be done to see if original cost-justification claims had been met. This set of statistics will certainly encourage skepticism among those inclined to believe that cost-justification is all done with mirrors, anyway.



Responsibility for Acquisition Evaluation (In Addition to End Users)

Some features of OA spending may be significantly different from other forms of capital allocation. The nature of office automation is such that it doesn't necessarily divide along existing budgetary lines. Some resources must be shared to be cost-effective, and in other cases corporate management may be interested in investigating new technologies that no individual manager would be willing to fund purely out of his own budget. Accordingly, it seemed worth asking exactly how expenditures were made.

Survey respondents were given four alternative descriptions of their expenditure process:

- All expenditures are made by end users.
- Studies and pilot projects are funded by a central OA budget, but all ongoing expenditures come from end users.
- Some ongoing expenditures come from a central OA budget.
- All expenditures come from a central OA budget.

An "other" option was also provided; one respondent took advantage of this to note that his organization's method of expenditure was "total chaos."

The most frequent choice (37%) was that end users are responsible for all expenditures, followed by a central OA budget paying for pilots and studies (24%), then by a central budget paying for everything (17%) and finally by the case where a central budget picks up some ongoing expenses as well as pilots and studies (16%). The fact that there is no overwhelmingly dominant pattern for handling expenditures suggests organizations are tailoring their OA budgeting practices to suit their particular circumstances.

Some significant differences became apparent when the sample was broken down by organizational size and by size of OA budget. In general, reliance on a central budget seems to increase with the size of the organization and the OA expenditure level. Smaller organizations were much more likely to assign all expenditures as an end-user responsibility than were larger organizations. Organizations with total OA equipment expenditures under $50,000 in 1982 were about half as likely to have all OA expenditures come from a central budget as were organizations spending more than that amount. Also, the tendency to fund pilot projects and studies from a central budget seemed to increase with both organization size and amount of OA expenditures.

Not all survey respondents were willing or able to indicate how much their organizations were spending on OA equipment, but enough did (298) to give us some useful information. Of those responding, about 28% indicated 1982 expenditures were less than $50,000, 30% placed the figure between $50,000 and $100,000, 38% put it between $100,000 and $1 million and the remainder indicated OA expenditures between $1 million and $5 million.

To nobody's great surprise, larger organizations tended to have larger OA expenditures. What is a little more surprising is that some of the smaller organizations reported relatively large OA figures: 15 respondents from organizations with revenues/budgets under $25 million indicated OA expenditures between $100,000 and $1 million. At a minimum, this means that 0.4% of revenues/budgets are being spent on OA equipment in these organizations — not an insignificant sum.

In many cases, OA spending is tracked as part of DP spending: 185 of the 325 respondents indicated this was the case in their organizations. About half of these replied that OA expenditures constituted between 1% and 5% of the total DP budget; only about 11% indicated it was more than 10% of the DP budget. Smaller OA budgets seemed to represent smaller percentages of their organization's DP budgets. This makes sense if you assume that smaller OA budgets imply that an organization is in a pilot or small-scale implementation phase, in which case, OA expenditures are likely to be limited relative to more established DP budgets.

Respondents were asked to indicate the direction and percentage of change between their 1981 and 1982 OA expenditures, and project the same things for their 1983 expenditures relative to 1982. On the whole, budgets have increased and are going to continue to do so. Of the 183 respondents who indicated at least the direction of change for both years, 100 said that their 1982 expenditures were more than those for 1981, and that 1983 would be larger still. In only one case were OA expenditures on a steady decline from 1981 to 1983.

However, the percentage of respondents indicating a stable OA expenditure level increased from 21% of the sample for 1982 vs. 1981 to 29% for 1983 vs. 1982. The survey results indicate that, while the OA market is increasing, a number of variables will dictate how quickly that market grows. OA

Elliott is associate director of research for International Data Corp., in Framingham, Mass. He is responsible for market research in the major OA technologies and is the author of the report referred to in the article.

Taking A Look At Data General

DG must prove itself in the OA marketplace if it wants to win a piece of the pie. And that's just what DG says it is going to do.

By Ann Dooley

Skeptics might say that Data General Corp. has an uphill fight ahead. Skeptics, however, aren't necessarily successful fighters, and that is what DG contends it is going to be.

In the midst of a recession, DG is not only expanding its base, it is also taking on established office automation vendors. More than any other minicomputer vendor, DG has sold to the OEM market. Now it is trying to appeal to end users in the fast-moving OA industry.

One of the up-and-coming minicomputer companies of the '70s, DG almost immediately began parading high-growth revenues and a "workhorse" of a machine called the Nova, a 16-bit minicomputer. But in 1980, DG's sensational revenue spiral of 45% annual growth ended. Although the bubble was bursting for many of its minicomputer competitors as well, DG's reputation has never been the same.

For the last several years, industry rumors have circulated that the company was on the verge of being acquired. The rumors stemmed primarily from DG's seeming inability to keep pace with an evolving marketplace. Critics contend DG was suffering from a product line and organizational structure that were rapidly growing obsolete. Once an overnight success story, DG didn't seem able to

maintain a sharp product focus in the evolving industry a decade later. In the 32-bit system market, for example, DG came in a year late.

Nevertheless, the company is refusing to listen to the doomsayers. DG's vice-president and chief financial officer, Kenneth Jaeggi, maintained that the company has never been in a stronger economic position and that the OA market is one of its top priorities. In the last six months, DG has also reportedly doubled its research and development efforts in the OA arena and made "sizable" investments in marketing and staffing.

Known as a conservatively managed company, DG recently was one of the first computer companies to strengthen its position against unfriendly takeovers. Although few high-tech companies have been victims of unfriendly takeover bids (as occurred in the Bendix/ Martin Marietta war), many will probably begin to be aware of the possibility. "If you're in it for the long term, you don't want to keep looking over your shoulder," John Adams, president of Adams, Harkness and Hill, Inc., commented.

With this and other moves, DG has demonstrated it plans to be around for the long haul. DG's 1981 year-end announcement of its Comprehensive Electronic Office (CEO) system clearly showed its competitors that the company was focused and committed to the office market. The industry consensus has been favorable concerning the CEO system, which is based on Eclipse minicomputers and Dasher workstations. Conceptually, the system lives up to its name, providing users with an integrated, comprehensive system including electronic filing, electronic messaging, administrative support, word processing, decision support, a local-area network (Xodiac) and data processing. It also supports both IBM-compatible Systems Network Architecture and X.25 communications capabilities.

An edge DG holds over the competition is that its products are deliverable today, according to J. David Lyons, vice-president and general manager of the Information Systems Division. When some executives and top sales staff left the company, DG enlisted a number of erstwhile IBM people. Lyons, formerly a director in the IBM product development group, was one of these. "It's hard to find any offering that is totally integrated across all operating systems and that can be shipped today," he charged. DG might have announced later than some others in the market, but it is further ahead in product development, Lyons maintained. In illustration, the ex-IBMer said that DG assumed as far back as 1977 that CEO would run on the AOS and AOS/VS operating systems, all communication product lines and on all processors from top to bottom.

DG defines the office from a broad perspective and its CEO system reflects this philosophy, according to Thomas Billadeau, president of The Office Systems Consulting Group. DG approaches OA via delivering computer services for all who work in the office — not through auxiliary services and add-ons, but in one package. "It's a commitment to be applauded," the Boston consultant noted.

But the system does have some problems. One is in its delivery to the end user. The CEO has a traditional DP entry approach, which is "totally unacceptable," and needs a soft-key functionality, Billadeau said.

David Terrie, senior analyst for office systems at International Data Corp., agreed, calling CEO well designed from the inside out: "Everything is integrated and fits together nicely." More work is needed in the system response time and in the word processing, but those are problems with a lot of the minimakers offerings, he added. Terrie's major complaint was also the user interface. CEO's function keys are complicated, but for a first time out of the box, it's very well done, he stated.

DG says it is aware of the problems and is working to improve the system. A new keyboard will be coming out this year with changes in the shape, touch and layout, according to Barbara Babcock, market development manager. DG's word processing has also traditionally been treated as a text method in which to enter the system, and it doesn't reflect the quality of the rest of CEO. "It's good, but not a star," she added.

DG intends to strengthen its WP offerings. It will introduce a dictionary to allow new methods of doing key words without using up a lot of system overhead. It also plans to upgrade interfaces — both in terms of enhancing the present keyboard to make it more friendly and researching different kinds of interfaces, Lyons said.

In addition to enhancing its present system, DG acknowledges CEO still has some pieces missing. One is an integrated voice facility,

and the other is a desktop or personal computer capability. DG intends to integrate full voice messaging and is currently talking with several PBX vendors, according to Lyons. Although the company has no timetable for a voice product, it's possible it will be available by the end of this year. DG will also be researching new types of workstations, Babcock said.

The company's commitment to standards support will reportedly remain unchanged, particularly in relation to fiber optics and the IEEE 802 CSMA/CD local-area network standard. It plans, in addition, to broaden its local-area network capabilities via the Xodiac. DG wants to remain flexible regarding local-area network alternatives.

While Lyons would not say specifically whether DG would be offering a personal computer, he alluded to DG's providing personal computing capacity rather than a personal computer per se. Although the company does not have a personal computer, Babcock maintained that existing personal computer offerings don't necessarily provide solutions to people's OA needs. A desktop personal computing device needs a network and shared data bases. The personal computers now available don't handle office work, Babcock said, adding that no one has yet come up with the final answer.

The company will be increasing its product breadth to include offerings for the large user and the smaller department, according to Babcock. DG has aggressively priced its newest entry, the MV4000, to gain a competitive edge and is hoping to use it to gain market entry into smaller departments and remote sites. According to Billadeau, DG appears to be heading toward using the MV4000 as a turnkey OA system.

DG sees itself as being an integrated office supplier, Robert Miller, vice-president of DG's Business Division, stated. OA will eventually become the umbrella under which DP will function, Miller predicted. DG may be behind companies like IBM, Xerox Corp. and Wang Laboratories, Inc. in establishing a presence in the OA market, but he contends it won't make any difference in the long run.

Only 3% of the total OA marketplace dollars have been spent so far, and that still leaves 97% open. "We're believers in the marketplace, that's our bottom line," Miller stated.

Lyons recognized that moving from an OEM base to an end-user market will not be an easy job. The company seems to be looking at CEO to spark the flame. Like other companies, DG is aiming CEO initially to penetrate its installed base. The question remains, however, whether it will be able to win any new market share. DG expects CEO to make a major contribution to its future. IDC's Terrie believes that, while it is a positive step, it may make less of an impact than the company is hoping for.

"DG is aiming CEO initially to penetrate its installed base. The question remains, however, whether it will be able to win any new market share."

In examining DG's future, John Adams remarked on the" difficulties in conducting business with rumors swelling around your name." But looking at the bright side, he added that CEO is a viable product that's beginning to sell and that should never be underestimated. "It's like making a beachhead at Normandy — once it's actually done things get easier."

Right now it's a great big, forgiving market, and the lines haven't settled yet, Adams said. DG may in fact be getting in at a good time. Because DG is smaller in size than IBM or DEC, for instance, it can be more flexible — which is good. At the same time, it doesn't have their assets, so it must be more selective — which may not be so good.

Agreeing that the financial rumors concerning DG would probably have an effect on any company, Billadeau noted that even if DG is eventually restructured or acquired, it is still a sound company and is not going to disappear. DG is in the position of needing to have a better strategy, pick its fights and not make mistakes, he stated. OA

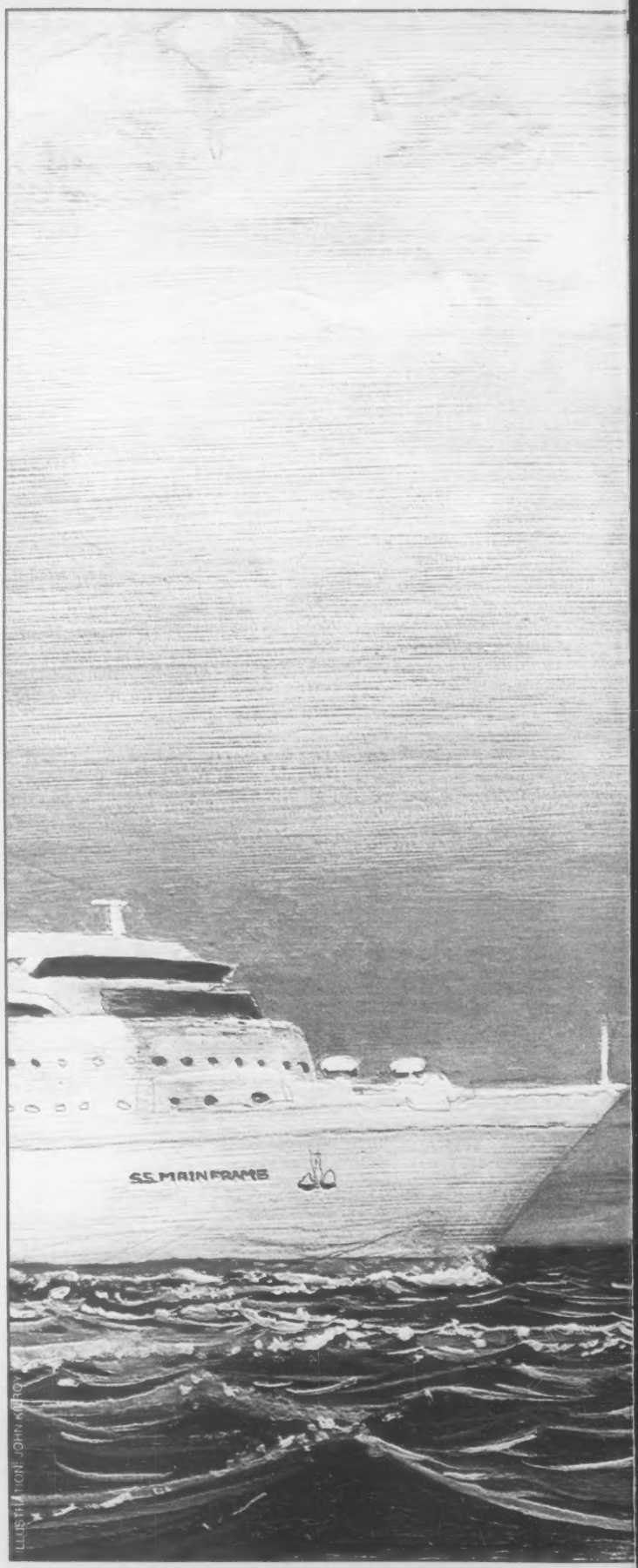
Dooley is editor of Computerworld OA.

Smooth Sailing

The mainframe computer environment was where it began. But now it's smooth sailing for personal computers, particularly in the office.

By Alan D. Mazursky

Microcomputers are producing a revolution in the way many of us function at work. Neither mainframe computer systems nor traditional word processing systems have had such an impact on our work lives. For the first time, users are finally getting control of their processing power. Business people are now using microcomputers as stand-alone or distributed "analysis" workstations, powerful WP systems, inquiry and data entry stations connected to mini or

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mainframe processors and as full business (production and accounting) systems.

Frequently we forget that the capabilities we now have with microcomputers were not available even three years ago. Until recently, all processing and analysis had to be performed either on the organization's mainframe or minicomputer system or by hand in quill-and-pen mode. Microcomputers now allow many office functions to be performed at costs considerably lower than those involved with more traditional minicomputer-based office systems.

Microcomputers now are being used to handle many business office needs, such as:

- Word processing, including report preparation, list processing and data-base handling of abstracts, comments and briefs.
- Financial analysis, including budget and financial statement analysis, systems modeling and simulation, portfolio charting and modeling and cash flow and production forecasting.
- Mathematical analysis: statistics, linear programming, Pert and CP/M (project or job stream control) and production and market modeling.

"The most important factor in determining the application of micros in the office is functionality. It is not the brand name or the biggest and best system that is important. Importance is gauged by what the system can provide for the users to make them better at what they do."

- Color-graphics generation: Use of full-screen and hard-copy color graphics, creation of free-hand graphics using digitizing tablets, display graphic and textual material through automated presentation systems.
- Communications: participation in electronic mail networks, accessing remote data bases, inquiry/data entry to host mainframes, accessing public networks and functioning as local-area network workstations.

The above functions and others are being performed through microcomputer workstations in many organizations. These workstations can be used as stand-alone applications processors or as part of distributed networks, tied into the organization's systems, local-area networks and broader networks.

The most important factor in determining the application of micros in the office is functionality. It is not the brand name or the biggest and best system that is important. Importance is gauged by what the system can provide for the users to make them better at what they do. Although 16-bit machines are here, many applications can be performed adequately and at a substantially lower cost with 8-bit micros. Similarly, many applications can and should be performed in a stand-alone configuration, while others dictate the need for a shared capacity (either multiuser or networked).

The 1980s has been identified as the decade of communications. During the coming years, the control, analysis and effective communication of information will be among the determining factors of an organization's health and viability. Much like controlling the factors of production was important for the industrial revolution, so will controlling the means of communication be important for the information revolution.

Micros are now being used to access many data bases available to the public, including Micronet, The Source and the Dow Jones News/Retrieval Service. These networks offer services, data and programs that can be used for business applications. Other specialized network services are also offered, like Auerbach (computer-related information) and Lexis (law-related information). Also, many micro systems are currently being used to access the Telex network for transmitting important messages to other workstations on the network. During this decade, these network services will proliferate.

Micros are frequently the sending and receiving computers for communications networks like Telenet and Tymnet, which support data, document and electronic mail transfers. Although most micros currently communicate asynchronously at 300 bit/sec or 1,200 bit/sec, full use of the public packet-switched networks supporting the ISO Open Systems Interconnect architecture will require that hardware vendors em-

bed X.25 communications protocol hardware in the next generation of microcomputer products. The use of X.25 protocols has the major advantage of guaranteeing end-to-end transmission of packetized data and therefore reduces the risk of receiving corrupted data.

A growing opportunity exists for organizations to take advantage of these public networks. Many companies are investigating the use of micros for collecting and communicating data (for example, factory orders) to various remote sites — domestically and abroad. These organizations have recognized that it is not necessary to use mainframes or minicomputers in situations where micros can be used effectively — and at a much lower cost.

In the move to put a workstation on every desk, we must consider how we want the system architecture to look from a functional standpoint. Do we want our workstations to have local storage and processing power while still communicating (implying a network design), or do we want to implement a multiuser micro environment (implying a more traditional minicomputer-type environment)?

Some of the larger microcomputer systems (such as those from Fortune, Altos Computer Systems, Inc. and Cromemco, Inc.) are capable of supporting a number of users on a single host "micro"-processor. Architectually, these systems are very much like the minicomputer systems currently available. However, lower cost configurations are possible and it is possible to run many of the popular microcomputer software packages on these systems. They also share with minicomputers a basic drawback — if the host processor goes down, so do the terminals.
the organization require this type of architecture for its processing needs?" If a data base is shared frequently and there is a heavy processing load, this might be the correct choice. If the work load is sufficiently large, consideration should probably be given to the minicomputer level.

The alternative of using a local-area network presents some interesting possibilities. A number of physical and logical design approaches are available for local-area networks and are described below.

☐ **Topologies:**

• Star — Devices are interconnected through a centralized network controller.

• Bus — Devices are interconnected directly by cables and may pass thru nodal control points.

• Ring — Devices are connected in a circular (ring) pattern.

☐ **Cabling:**

• Twisted pair — Essentially phone-line cable. Offers low cost and low-speed transmission (56K bit/sec).

• CATV — Essentially cable TV cabling. Offers high cost and high-speed transmission.

Application	Product	Vendor
Spreadsheet Packages	Visicalc	Visicorp
	Supercalc	Sorcim
	Multiplan	Microsoft
	Calcstar	Micropro
	Target	Comshare target
Financial Modeling	DSS: Financial	Addison-Wesley Publishing
	Context/MBA	Context Management
	FPL	Lifeboat Associates
	Finplan	Hayden Publishing
Word Processing	Wordstar	Micropro
	Vedit	Compuview Products
	Easy Writer	Information Unlimited
	Word Juggler	Quark Engineering
	Scriptsit	Tandy
	Word Handler	Silicon Valley Systems
	Final Word	Mark of the Unicorn
Data Base Systems	Dbase-11	Ashton-Tate
	DB Master	Stoneware
	Datastar	Micropro
	FMS-80	Systems Plus
	Condor	Condor Computer
Graphics	Apple Business Chartmaster	Apple Computer
	Visiplot	Decision Resources
	Strobe	Visicorp
	EBS	Strobe
		Lotus Development
Communications Software	Microlink	Wordcraft
	Amcall	Microcall Services
	Data Capture	Southeastern Software
	Micro-Courier	Microcom
	Z-Term	Southwestern Data Systems

Figure 1. Some Widely Used Micro Software Packages

☐ **Communications control logic:**

• Token passing — A device is allowed to transmit only when it gains control of a "token." Token passing is best suited for long transmission lengths and large message packets.

• Carrier sense multiple access with collision detection (CSMA/CD)— Devices monitor transmission line for a not-busy condition. Data transmission is monitored by device to determine if data packets have collided; if so, data is retransmitted. Suited for small-size data packets.

☐ **Capacity:**

• Baseband — Offers transmission speeds up to 10M bit/sec. Assigns capacity of network to one transmitting device at a time. Offers low cost and is good for low-volume data traffic.

• Broadband — Offers very high-speed transmission, is capable of supporting data and voice communication and supports concurrent device transmissions. Entails high cost and is good for high-volume transmission.

Two popular microcomputer-based local-area nets are Cluster One by Nestar Systems, Inc. and Omninet by Corvus Systems, Inc.; both use the twisted-pair architecture. One possible drawback of this type of network is that support is currently offered only for a limited selection of micros, which forces a hardware standardization. (In the larger sense, this may or may not be warranted).

Other micro-based networks now being implemented by many corporations include, among others, Digital Research, Inc.'s CP/Net and Zilog, Inc.'s Z-Net. Micros can also link into mini-based local-area nets such as Ethernet from Xerox Corp., Intel Corp. and Digital Equipment Corp.; Wang Laboratories, Inc.'s Wangnet; Datapoint Corp.'s Arcnet; Sytek, Inc.'s Localnet.

Many issues should be considered before a decision is reached on a network or multiuser implementation. These issues — such as work load, technological integration, functionality, cost/benefits and software availability — have always been the core of intelligent DP decisions. As microcomputer applications become increasingly more sophisticated and complex, so, too, do the types of decisions we make about their implementation.

There is no quick answer as to which techological alternative to select, but the driving force should always be the strategic business need.

Microcomputer software has already distinguished itself as being innovative, user-friendly and powerful. The available software includes systems for word processing, portfolio analysis, financial and production modeling (including simulation and forecasting), data base management and full-blown accounting systems. The acknowledged leaders in the marketplace show a flair for understanding what users need, presenting the system to users and maintaining reasonable pricing structures and — more importantly — quality. Some widely used software packages are shown in Table 1.

The following popular applications have found a firm foothold in the automated office:

• Spreadsheet packages: These are the primary legitimizing factor for businessmen. They enable nontechnical users to "program" financial forecasts, budgets and so on. They also provide interfaces to graphics processors for such things as trend lines and pie and bar charts, and they are excellent for small modeling tasks.

• Financial modeling languages are used for complex models with large data files. They provide some integration of functions and are considerably more expensive than the spreadsheet packages.

• WP packages include most, if not all, of the features offered by mini-based WP systems and they are considerably less costly than traditional WP systems. They enable users to prepare reports (including spreadsheets, graphics and so on) without resorting to the typing pool or report department. They also allow users to transfer documents to and from many WP systems.

• Data base systems support users in complex tasks by presenting a logical (relational) view of data to the user; by absorbing the detail file/data management tasks, thus allowing the user to concentrate on managing the application, not the data; and by functioning as a very useful centralized data center for users connected on a local-area network.

Possible applications include financial and market modeling, document and brief abstracts, personnel assignment and client billing and integrated accounting systems.

• Graphics systems offer enhanced data presentation capabilities. ("Everything is in the delivery.") They also function as interfaces to data bases, spreadsheet packages and modeling systems.

• Communications packages provide communications protocol support for asynchronous transmission (public networks), bisychronous transmission and 3270-emulation and packetized transmission (for example, X.25 protocols). They also enable connection to public-access data bases, corporate mainframe host systems, other micros (point-to-point) and so on.

Over the past few years, the mi-

cro-software industry has experienced considerable growth both in numbers and sophistication. A shift has occurred from the cottage industry to the corporate environment. Software systems have blossomed from those with limited stand-alone functionality to those employing concepts of multifunctionality, integration and communication. (Table 2 provides a brief recap of the microsoftware industry). The next few years should bring the implementation of truly integrated software (and hardware) systems. These systems will:

- Require little technical computer expertise. Users should not have to worry about brand of computer, type of operating system or management of data files (for example, details of I/O access methods or conversions).
- Benefit users who understand problem solving techniques and are not afraid to try new approaches.
- Integrate such functions as word processing, graphics input and output, automated slide-show presentation capabilities, voice recognition and synthesis and communications protocol support.

These types of packages are beginning to appear. For instance, Context/MBA and Micro-DSS:F display some of the integration features mentioned above. The current marketplace will show a radical shift over the next year — all for the better.

The early 1980s has brought a natural evolution of hardware from an 8-bit world (Apple II, TRS-80, Osborne I, Commodore CBM, and so on) to the more powerful 16-bit microcomputers (such as the IBM PC, Fortune 32:16 and the DEC Rainbow). The following shifts are occurring:

- ☐ Main memory:
  - 64K bytes to 1M byte.
- ☐ Mass storage:
  - Floppy diskettes (400K bytes) to hard disks (20M byte).
- ☐ Operating systems:
  - Single to multiuser.
  - Uniprogramming to multiprocessing.
- ☐ Technology changes:
  - 5.25 in. floppies to 3 in. rigid floppies.
  - High-resolution screen color graphics.
  - Use of digitizing tablets, touch screens, light pens, voice and so on as input devices.

From the perspective of functionality, organizations should not be concerned with the particular piece of hardware being used. Hardware is nothing but a commodity, like a record player or a typewriter. If the hardware and software satisfy a particular need and are consistent with the organization's objectives, then users should be given the latitude to acquire these support systems.

Of course, the key phrase here is "the organization's objectives." Management should always be looking toward the future needs of the organization. Consideration should be given to the possible requirements for integration and compatibility, as well as to the need for short-term expedients.

"From a very pragmatic point of view, we need to recognize that, for many organizations, the current mainframe DP systems are barely able to produce the minimum information required to run the business, much less support management and staff with their analytical requirements."

Many articles are being written on the dangers of proliferating different microcomputers and generating distributed data bases. These problems should be recognized and understood by management in the context of short-term and long-term goals. However, from a very pragmatic point of view, we need to recognize that, for many organizations, the current mainframe DP systems are barely able to produce the minimum information required to run the business, much less support management and staff with their analytical requirements. Often, users' requests for mainframe analytical systems are put into a backlogged development queue with delivery promised for two to five years down the road.

Therefore, we must support users who wait to implement their decision-support systems in the


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short term and not focus on long-range requirements to the exclusion of what can be achieved today using microcomputer technology.

Operating systems on the micro level have been important in determining users' and software vendors' acceptance of the hardware products. Basically, there are two types of operating systems: proprietary (like Appledos and Trsdos) and generic (like CP/M, Msdos and Unix).

Proprietary operating systems function on only one vendor's hardware, while generic operating systems will function on the hardware of many different vendors. Obviously, generic operating systems, in providing the ability to run the same compiled software on different vendors' products, have become important in determining the distribution channels for software and the popularity of hardware systems. It is reasonable to infer, then, that proprietary operating systems will have a difficult time succeeding in the marketplace unless the hardware has particularly good application software features. The implications for these vendors are clear. Table 3 on Page 24 contains a listing of some popular operating systems.

Time Frame	Description
Late 1970s	Home-grown and limited-function software.
Early 1980s	Packaged software, including: WP and electronic spreadsheets.
Mid 1980s	Integrated software packages: single "systems" combining WP, graphics and modeling software.

Figure 2. Development of Micro Software Technology

Digital Research's Control Program for Microprocessors (CP/M) was the first of the popular generic operating systems available for 8-bit computers using the 8080 family of microprocessors (including Z80, 8086 and so on). CP/M was patterned generally after DEC's RSTS minicomputer operating system. It currently is available on over 200 models of microcomputers and has become the de facto standard for 8-bit operating systems. Many hardware manufacturers have been able to bring their microcomputers to the marketplace very quickly because of the existence (and modularity) of CP/M and the general availability of software packages running under the CP/M operating system.

One of the great debates currently raging is "Is CP/M dead?" CP/M is often seen as the masthead of the 8-bit world, and this question arises because of the proliferation of 16-bit micros, which threaten to crowd out the 8-bit systems. The question really should be "Is the 8-bit world dead?"

The answer is "No!" at least in a two- to three-year time frame. Currently, 8-bit machines perform many functions very well and at a cost significantly below the 16-bit systems. It makes little sense to spend extra money for a 16-bit machine if all the functionality required for a particular application is on the 8-bit level.

Certainly, as prices drop, users will be getting more bang for the buck. Full-blown 8-bit machines will become available at lower prices; as a result, more organizations will be able to take advantage of the power of micros. The 8-bit world — and CP/M — should therefore be with us as the low-end market at least for the near term.

Looking to the rest of the '80s, we expect that users will not have to know which operating system they are using. The operating system will be increasingly transparent to the application and to the user. Several operating systems will probably survive on the 16-bit level, including CP/M-86, Unix and the UCSD P-System. These systems will provide the core for the stand-alone and distributed processing workstations of the 1980s.

Management surely recognizes that information and the means to get at that information constitute vital organization resources. As micros become more a part of OA systems, we must become acutely aware of both their power and limitations. In many organizations, management (including DP

8-Bit	16-Bit	Vendor	Comments
Appledos		Apple	Proprietary
Trsdos		Tandy Corp.	Proprietary
Hdos		Zenith Data Systems Corp.	Proprietary
CP/M	CP/M — 86	Digital Research, Inc.	Portable, single user
MP/M II	MP/M — 86	Digital Research, Inc.	Multiuser
	MSDOS	Microsoft, Inc.	Developed for IBM Personal Computer
UCSD P-System	UCSD P-System	Softech Microsystems, Inc.	Very portable, uses concept of pseudo machine
	Unix	Western Electric Co. .	Originally developed for minicomputers
	Xenix	Microsoft	Unix look-alike
Oasis	Oasis-16	Phase One Systems, Inc.	Single or multiuser systems

Figure 3. Available Operating Systems

management) pays very little attention to the management of information and technologies or to supporting technological innovation.

The rapidly changing technologies require that those at the upper levels of an organization must become more familiar with the technologies and manage — not control — the spread of microcomputers.

Many managers do not fully realize the implications of implementing micro-based OA systems. They assume either that goals stated in general terms can easily be translated into a microcomputer implementation (based on all the success stories appearing in the trade press), or that nothing should be implemented because the technologies have not yet matured. Management (and staff) must be educated regarding technological alternatives.

Further, management should not control the use of micros for OA; rather, the use of micros should be properly managed. Control implies limitation — the antithesis of the concept of a personal computer — and may well be resisted by users attempting to satisfy the requirements of their particular function in the organization. It is inappropriate to define the best hardware and software systems for an organization. The edict approach does not recognize the rapidly changing nature of the microcomputer industry.

To be sure, management should have real concerns about the use of micros. Most of these concerns should be addressed by policy statements. Microcomputers should be thought of as nothing more than office equipment, like electronic typewriters. Micros are only tools to be used by management, staff and support personnel. The acquisition of a micro should therefore be tied to a real business need and should be able to fulfill that need in a cost-effective manner.

Many microcomputers in the office will continue to be primarily stand-alone application systems — whether it be WP, financial or production modeling or forecasting. For these types of systems, management should set general policy guidelines for equipment acquisition. These guidelines might include such things as recommending (but not mandating) specific equipment for acquisition, purchasing procedures, training requirements and suggestions for packaged software.

For computers that will be connected to a host mainframe or interconnected via local-area networks, management must set both general and specific guidelines. For instance, data access and privacy issues must be addressed (and therefore, access to the network or host must be properly controlled). Also, physical access to the microcomputer hardware and data storage floppy diskettes must be controlled in some manner (at minimum, by storing vital program and data disks in a safe place).

In all cases, management should support the education of employees with these new tools, encourage formal and informal corporate communications (including underground newspapers, if necessary) and inform the organization of changes in policy and major development projects under way.

The points to be conveyed to management are:

- There is a need to understand the rapidly changing nature of the micro technologies.
- There is a need for management to be flexible in dealing with the growth of micro technologies within their organizations.
- Access to information should be *controlled*, but the hardware/software solutions should be *managed*.

Micros are becoming firmly entrenched in our OA systems — whether as stand-alone or interconnected application processors. They have achieved recognition as truly functional workstations. Furthermore, the available software demonstrates an understanding of what users need to help them improve their work product.

The next two to three years we will see the widespread use of 16-bit machines and the introduction of 32-bit architectures. The 8-bit world is not dead; its universe, however, has been redefined. It will now serve the low-end, entry-level marketplace. The 3-in. rigid floppies will proliferate and the cost of hard-disk drives will plummet.

Software is moving toward supporting an integration concept in virtually every application area. Combining the new software technologies and support of many communications protocols will put microcomputers in the forefront of the multifunctional workstation marketplace. Micros will become an increasingly important part of local-area network implementations. Microcomputer-based graphics systems will become vital elements in the modern automated office.

Management will be responsible for supporting, if not spearheading, the proper implementation of micro systems in the office. This support will take the form of general and specific policy statements, providing technical support through the DP department, setting certain guidelines for purchasing micros and hooking into local networks or the corporate mainframe. OA

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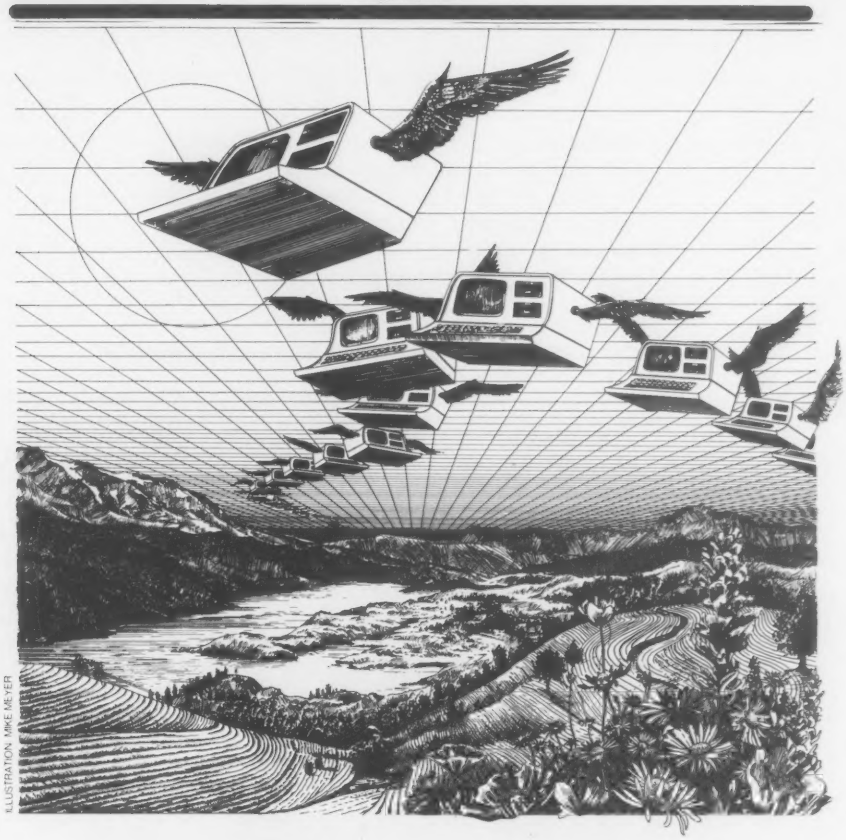


ILLUSTRATION: MIKE MEYER

Beyond Word Processing

Users are searching for migration paths as they move beyond single-application functions and head toward integrated solutions.

By Amy D. Wohl

Word processing was the first office automation technology to gain broad acceptance and usability in the business community. To many, it seemed — and in fact still seems — to be the only OA technology. Most of us, particularly in large organizations, have already made considerable and long-standing investments in word processing.

But office automation is not word processing, although it does include the office function of creating and manipulating text. To explore ways in which organizations can and should expand into OA from existing WP bases, let's examine some OA requirements.

• OA offers a full set of functions to support a wide variety of office tasks. These functions include not only WP, but also electronic mail, including messaging and document distribution; electronic filing; administrative support such as

calendars, scheduling, reminder systems, telephone and mail logs and so on; personal computing and decision support; business graphics; and the ability to access data on both internal and external data bases.

• OA offers this functionality to a broad set of office workers, including secretaries, administrative staff, professionals and managers (including executives).

Some systems support only horizontal slices of the office population — for example, word processors for secretaries, or microcomputers with Visiclone software for professionals in planning jobs. Such systems tend to enhance the performance of a specific worker in a specific task, but they fail to incorporate that enhancement into a system where information can be further supplemented by the ability to share it in meaningful ways.

In fact, in this preautomation period, individual electronic tools may actually isolate workers and make certain tasks more difficult. If you doubt this, take an information poll in your organization. Ask how many professionals and managers, on their own, could locate, edit and print out a document currently located within the WP system.

• OA enables proliferating functionality and access (this means individual workstations) throughout an organization. It requires not only a sufficient number of workers to ensure the occurrence of a sufficient volume of interesting interactions, but also the right selection of workers. In the building stages of an OA system when every worker is not yet on the system, all workers who share a set of information need also to share the system.

• OA requires interconnection. OA does not occur when every worker has his own individual personal computer, although it is perfectly possible to build an OA system out of adequately interconnected personal computers. In order for OA requirements to be satisfied, these individual workers must be interconnected. This interconnection allows the implementation of office functions such as electronic mail and information sharing through shared files and data bases.

From a hardware point of view, it is perfectly possible to "grow" an OA system from appropriately functional word processors by means of additional function and additional users (and, therefore, more workstations). However, such direct growth may be psychologically difficult or overly expensive.

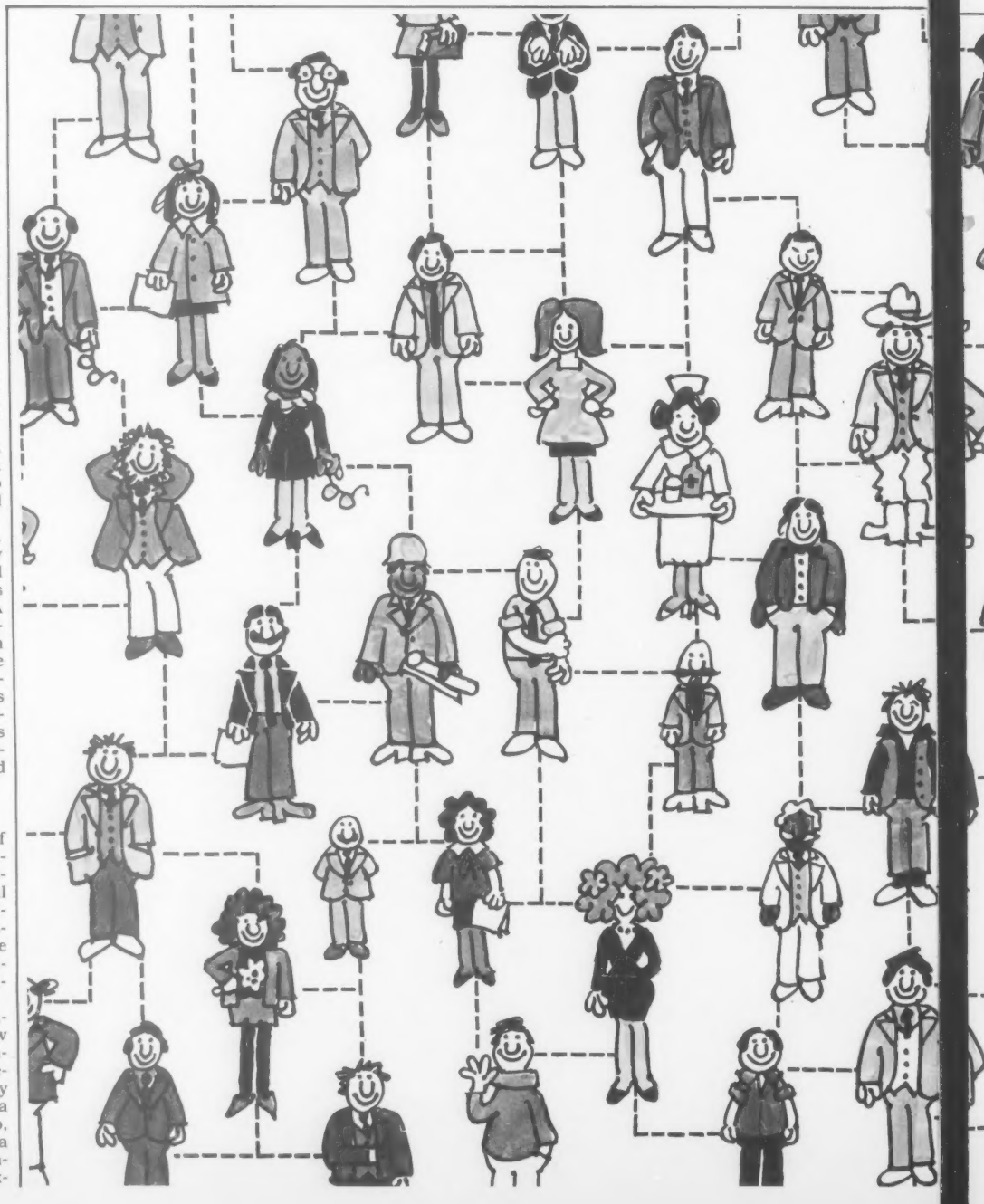
Difficulties from an organizational/psychological point of view may be encountered if professionals, managers and executives resist a system because they perceive it to be an extension of a clerically oriented system. Also, systems that grow directly from a WP hardware base may overemphasize word processing at the expense of management-oriented functions such as data access and use, decision support and business graphics.

"Difficulties from an organizational/psychological point of view may be encountered if professionals, managers and executives resist a system they perceive as an extension of a clerically oriented system."

Difficulties because of expense stem from the fact that typical stand-alone word processors (with printers) now sell for $7,000 to $14,000 each. Microcomputers with professional or managerial/professional software can be purchased for as little as $2,000 each. It is more realistic, however, to anticipate levels of $3,000 to $5,000 plus printer, with WP printers costing just under $3,000 each in the microcomputer market.

Multiworkstation WP systems generally average out to about $20,000 per workstation when configured with adequate storage printing. This may make the cost of a professional or managerial workstation higher than desired, when additional WP workstations with suitable software are used as the engine for direct expansion into OA.

How then can organizations expand into OA from a WP base



without burdening themselves with the problems of overemphasis, incorrect perception or expense mentioned above? A smooth migration from a preautomation technology like word processing to the additional productivity offered by OA requires an in-depth understanding of the office work place, its function and the skills and limitations of its workers. Within organizations that have invested in word processing, particularly within those organizations that have also invested in a considerable infrastructure to support technology, a great deal of knowledge and experience exists.

This accumulated knowledge and experience relates to the work the office performs and to techniques that have been successful in a particular organizational culture for encouraging the acceptance of technology. The managers and analysts who have participated in the design, implementation and on-going management of the WP system represent a seasoned core of trained workers who should be important participants in the design and implementation of the OA system.

"A smooth migration from a preautomation technology like WP to the added productivity of OA requires an in-depth understanding of the office work place, its function and the skills and limitations of its workers."

Most organizations that are looking at or planning for OA support this process through the formation of an OA task force or committee. Obviously, WP management should be a strong participant in this task force or committee. The committee should also include participants from DP, telecommunications, administrative management, personnel, facilities management and corporate planning.

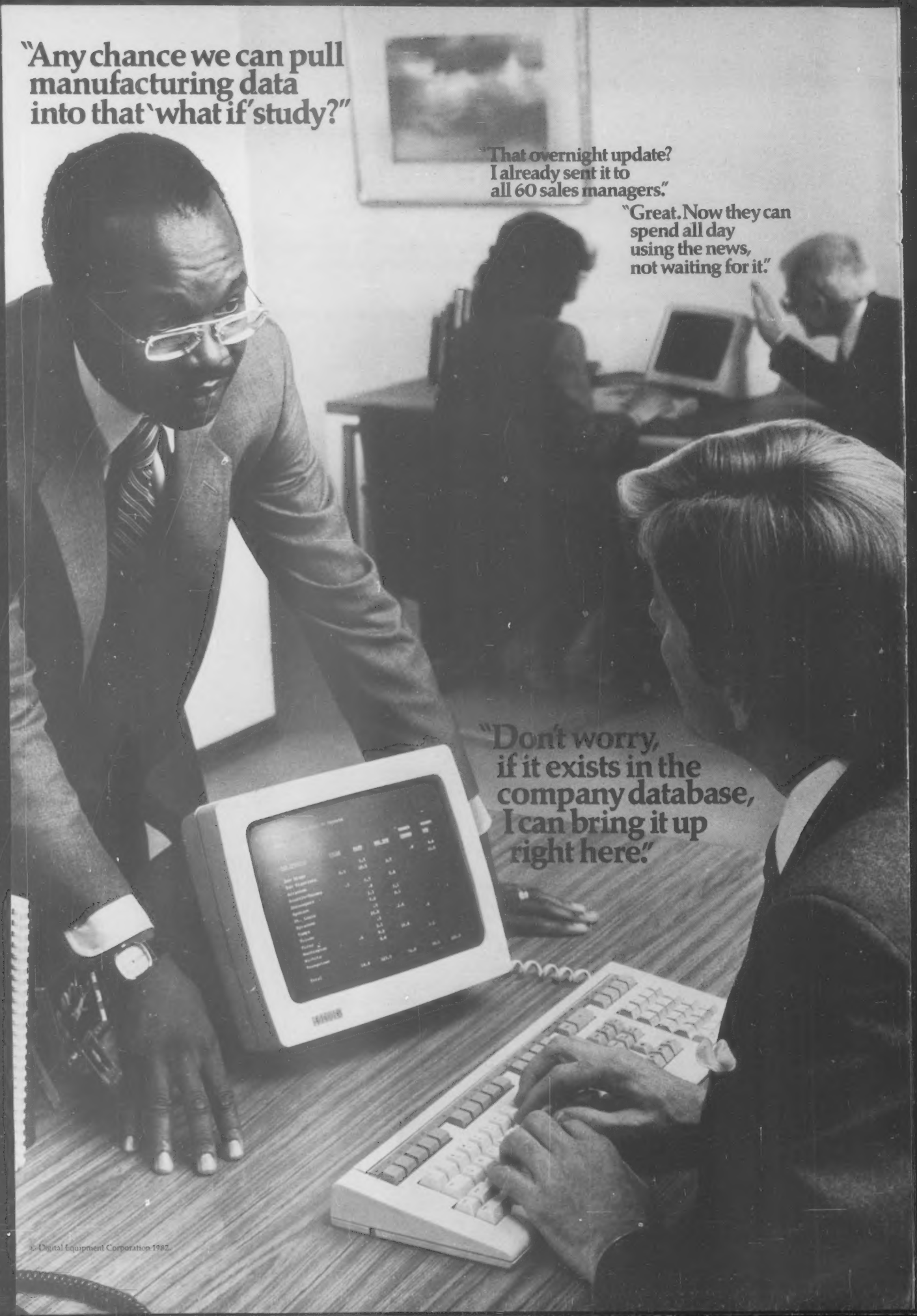
In some sense, word processing will, as a primary function, speak out for the need for the OA system to provide a strong WP capability, fully compatible or at least readily convertible to the existing WP system. But this is not its only function. For many organizations, word processing represented the first attempt to bring about the successful use of computer-based technology by office workers who did not (at least initially) think of themselves as DP professionals.

As a result, WP should be able to provide the task force with valuable insights into this problem, particularized for the peculiarities of the organization. It is important to note that these insights will focus on the fears, abilities and eventual successes of skilled clerical workers (generally typists and secretaries). Other sources must contribute information on the fears, capabilities and business needs of other populations, such as professionals and managers.

The WP experience has at its heart another, quite different, preautomation benefit. Firms that process most of their words through WP systems have an enormous portion of their files already stored electronically. Often, these WP files are thought of quite separately from the formal — and normally paper — filing system. Nevertheless, this stored information provides the basis for the start of an electronic filing system.

In addition, most WP workstations are or can be equipped as communicating devices. This makes them immediately usable as electronic mail stations, provided the OA designers pick a system that will accommodate them. In organizations with considerable inventories of existing word processors, the ability to continue to use existing (and presumably already paid-for) equipment can be an important part of the system's initial cost and its cost-justification.

Of course, if the vendor of the firm's installed WP equipment is vigorously pursuing the OA marketplace, the WP system may seem to be the obvious base for the OA system. Please keep in mind, however, our previous caveats. If the system is perceived as a clerical system; if the equipment serves word processing well, but is not a fully functioned OA offering; or if the cost of adding work-


"Any chance we can pull manufacturing data into that 'what if' study?"
"That overnight update? I already sent it to all 60 sales managers."
"Great. Now they can spend all day using the news, not waiting for it."
"Don't worry, if it exists in the company database, I can bring it up right here."
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stations is excessive relative to other design alternatives, then the ability to leverage existing hardware may not be a sufficient benefit.

In the last year, something new was added to the OA formula. That something is the strong appearance of personal computers throughout American businesses, particularly on the desks of professionals and managers. The rapid proliferation of these desktop workstations will increase at astronomical rates over the next few years. This proliferation will not wait for the results of our OA experiments. Personal computers will shortly exist in such numbers that no future OA plan will be able to ignore them. In fact, for many firms, it is likely that the OA workstation will be a personal computer.

This may mean an essential change in the way we perceive possible paths to OA and the relation between WP and OA. We currently have approximately one million word processors in use. Many of them represent very old technology, dating back to the mid-'60s. By 1985, the number of personal computers being used in large companies will exceed the number of WP workstations in those same companies. (We will, of course, continue to add word processors, but at a rate much slower than that of personal computers. It has taken nearly 20 years to get those word processors in place, and almost all the word processors ever created are probably still in use somewhere.)

"Assume that some compromise is necessary initially — less OA function, less WP function, some incompatibility or expensive workstations. No system offers everything yet!"

When the number of personal computers in the hands of professionals and managers (mainly for personal computing, decision support — especially Visiclone usage — and data access) substantially exceeds the number of word processors in the hands of WP operators and secretaries (mainly for text manipulation and some departmental records processing), then it will be time to rethink the relative importance of the various parts of an OA system. The migration to an integrated OA system has quickened since word processing became standard operating procedure in the office. In the beginning, we thought the most important part of any OA system was the part that replicated the task we had already somewhat automated — text. We sneered at systems that offered less than full-blown word processing, even while we noted that many system users would not employ this facility.

Next, in a middle period, many systems offering less than full-blown word processing will be (and are being) installed. This makes them less useful because they generally cannot replace the WP system, but must somehow exist beside it. In poorly thought out systems, word processors (the people) are forced to accept less function than they had before, which in most cases is a bad solution. Another consequence of this lack of thought is that two incompatible systems live side by side, while someone gets to do a lot of rekeyboarding. A third bad result, also to the users' detriment, is that the systems don't know much about each other's contents.

The end of the middle period is marked by the design of transfer mechanisms. These mechanisms make it easier (or at least livable) to put two incompatible systems — WP and OA — side by side and to assist the user in transferring information from one system to another. The IBM Document Interchange Architecture (DIA) is an attempt to treat this problem within the IBM product set. Multivendor solutions can be expected from other vendors soon.

Such solutions are useful, but they fail to address the problem completely. It is an unpleasant but immutable fact that all such transfers and transformations are necessarily incomplete. The system can handle with agility only those functions that both systems include; for any functions that exist on only some of the systems involved, only a print image (with no editing codes) can be passed. The result is that something less than full editing in a smoother and seamless environment is being offered.

What follows this middle period? Ultimately, we will want systems that include both superlative word processing and a full set of properly implemented OA functions. Such a system will not compromise either community of users — at least not too much.

It will also take into account the fact that nearly everyone will want to process words sometimes. Some of us will be skilled WP operators with high skill levels and the need to handle complex activities. Some will be infrequent users, seeking only to get our thoughts down on electronic paper with an eye to allowing the skilled WP professional to edit, format and formalize our output later, much as those functions are provided for professionals today.

From a nitty-gritty real-world point of view, what do we need to know and do to get beyond the WP systems we have today and move toward the OA systems that offer such promises? We need to do the following:

- Understand that office automation means providing a full set of office functions to every office worker. It means providing each office worker with an individual workstation interconnected into a supportive, enveloping environment for communication and information sharing.
- Understand the role the personal computer will play in speeding up the advent of OA and its proliferation. As this proliferation occurs, the focus for OA and the relative perceived importance of various systems functions will shift.
- Plan for OA with a task force or committee that includes all the relevant technologists in the organization. Include the expertise of word processing, but understand that it is important to the success of the ultimate office system that it not be perceived as an extension of the clerical system and, therefore, as a system for clerks.
- Take existing WP hardware into account in designing an OA system. It may help save money and proliferate more quickly. On the other hand, don't let it bias selection activity too strongly — other considerations may be more important.
- Assume that some compromise is necessary initially — less OA function, less WP function, some incompatibility or expensive workstations — no system offers everything yet!
- Hope — I want to say assume, but I'm afraid to — that systems get cheaper, more compatible and much easier to use.

Remember, every time you vote with your purchasing dollars to buy a good system or pass up a bad one, you help to encourage this process. OA

Wohl is president of Advanced Office Concepts, an OA consulting firm for vendors and users, based in Bala Cynwyd, Pa. Wohl is also editor of the "Advanced Office Concepts Newsletter."

It's a Jungle Out There

Users coping with automation may feel lost in a jungle of data. The Information Center can help them find their way back to civilization.

By William Clarke

As microcomputers and user-friendly software tools for non-DP personnel proliferate, more institutions are discovering they need to support end-user computing. Some label their new strategy an "Information Center"; others attempt to incorporate it into their traditional applications development process. Of the two approaches, the Information Center concept is proving to be the more successful long-term strategy. End-users are beginning to carve out a place in the modern organization, and

ILLUSTRATION BY TOM BARRETT

management information services departments must meet the challenge by establishing specialized departments to support them. The Information Center is a department that will train end users to access their own data and generate their own reports. Some 42% of large IBM installations have already implemented the concept.

The key idea behind the Information Center concept is end-user self-sufficiency. In many organizations the backlog of applications has reached staggering proportions. It is not uncommon to hear of backlogs spanning three years and longer. The Information Center provides an effective method for cutting through the backlog.

In a well-organized center with good data administration support, some 70% of the requests from end users can be satisfied using on-line report generators and query languages. Most installations already have some kind of internal time-sharing facility. Seventy percent of IBM sites have some internal time-sharing software. This is up from just 33% three years ago and should climb to well over 80% in 1983.

The time-sharing facility is often used exclusively by the programming staff of the MIS department for on-line programming and debugging. When an Information Center is established, many installations simply expand the existing time-sharing facility and allow end users to access their own data with user-friendly report generators, query languages and graphics software.

Over the past two years, many organizations have established Information Centers with varying degrees of success. Those that have been the most successful with the concept have kept most (if not all) of the following points in mind.

The charter of the Information Center is to improve the productivity of the organization. In these times of economic stagnation, organizations are being called upon to accomplish more with fewer resources. If the center's charter is to improve end-user productivity, its orientation will be more forward looking and the staff will make a longer term impact on the profitability of the organization. Short-term objectives should not become the mission of the Information Center.

In one organization, for example, the "mission" of the Information Center was to bring all existing outside time-sharing applications in-house. In its first two years of operation, the center saved the organization $1.5 million. It had successfully achieved its objectives.

There were two unintended consequences, however. After all the time-sharing applications were converted, the Information Center ceased to have a clearly defined function. As a result, the support for the end users deteriorated, and many felt they were better off returning to the outside services. The center would have been more effective if the original mission had been to improve productivity, and a short-term objective had been to convert outside time-sharing applications.

Treat your Information Center as though it were a business. Information Centers that consider themselves a business within a business are much more successful in managing their resources and gaining the support of their end users than those that consider themselves just another specialized support function within MIS. The latter tend to be not so responsive to end users and to have a more difficult time justifying their budgets. What does it mean to be a business within a business? Here are three key elements:

- The Information Center budget is based on the amount end users are billed for the services they use.
- A walk-in center and a formal method for training and supporting end users are implemented.
- The center actively markets its services to end users.

User departments should be invoiced for the computer resources (compute and I/O) and other services they use. Some organizations have sent out sample invoices the first year of operation in order to provide their users with some basis for budget planning. If the center's budget is based on how much its services are used, it is easier to justify budget increases and to muster support from end-user departments that want more services. By sharing the expense of the Information Center, it becomes a company resource.

A walk-in center and a formal method for training and support gives the users easy access to terminals, plotting devices and user reference manuals. It also improves the visibility of the Information Center. Ideally, a formal classroom for training end users should be set aside with a schedule of training sessions.

Most successful Information Centers take an active interest in promoting their services through the use of slide presentations, seminars, articles in the company newspaper, internal mailings and demonstrations.

Segment your market and identify a niche. It is a good idea to survey your potential growth. The results may be surprising. One organization found that 48% of their potential users had some first-hand computer experience, even though only 19% used computers in their jobs. Some 75% felt on-demand computer services would help them to be more productive in their current positions.

The survey should point out the alternatives end users have selected to meet their applications needs. Some will have acquired a personal computer, others will be using outside time-sharing services and still others will have purchased stand-alone minicomputers for word processing and data handling.

"The key idea behind the Information Center is end-user self-sufficiency. In many organizations, the backlog of applications has reached staggering proportions. It is not uncommon to hear of backlogs spanning three years and longer. The Information Center provides an effective method for cutting through the backlog."

Many organizations are spending more on user-purchased hardware, software and services than they realize. One large manufacturing company discovered that end-user purchases accounted for 40% of the total dollars spent on hardware, software and services. In some instances these dollars were well spent; in others, they were redundant to what was already available. The Information Center should adopt a strategy that fits smoothly into the way user departments are currently operating. Users should not be forced to convert to the Information Center service if it will impair their productivity or cost them more.

Hire and train the best people for the job. The Information Center staff should be selected for their people skills and business experience rather than for their technical knowledge. The best people for supporting end users are not always those with the heaviest DP experience. Indeed, it is sometimes the individual with no previous programming experience who develops into the most versatile and reliable support person. Over time they will become expert in the software packages and data that is available through the center.

As any good entrepreneur will tell you, product knowledge is the key to a successful enterprise. The Information Center is no different. Take extra care in training the center's staff in the software packages that will be offered and on the procedures for securing access to the data requested by the end users. The support staff should be able to teach end users how to use the center's services. They should also be able to present the benefits of the Information Center. Have them practice demonstrations and presentations that will sell end users on the center's services. Tests have shown people tend to have more enthusiasm for an idea after they have made a presentation to someone else about it. The center's staff will become more enthusiastic about their role as they sell end users on the Information Center concept.

Select general-purpose, easy-to-use software. Start with tools that have the greatest versatility and add specialized packages as the market develops. Too many specialized software packages, each with unique features and syntax requirements, will confuse end users and put a strain on the support staff people who have to learn them all. Many Information Centers are built around three generic types of software:

- A fourth-generation language, such as Nomad 2 or Ramis II.
- A financial analysis package.
- A natural language query facility, such as Intellect.

The fourth-generation language usually does most of the work for end users who want a tool for general problem solving. The financial analysis package will answer the specialized needs of budgeting and financial planning. The natural language query facility is extremely useful for providing demonstrations to top executives and management. In one company, the whole Information Center concept was sold on the basis of a natural language facility that was demonstrated to the chairman of the board and the board of directors. All the packages should have good documentation and training materials designed for end users.

Whatever packages are selected for the Information Center should also be available on an outside service. This will allow the center to use the outside service as a backup or to handle applications that cannot be supported easily with existing in-house resources. One installation decided to bring all its new Information Center users up on outside time-sharing before bringing them up on the in-house machine. This gave them an opportunity to evaluate the resource requirements of a user's application before committing to it.

Develop detailed procedures for securing access to data. An Information Center that cannot provide its users with the data they need is like a restaurant that does not serve food. Data is your most important asset and the most difficult to control. Well-

thought-out procedures for controlling the accuracy and currency of data should be put in place. Some detractors of the Information Center concept feel it will eventually founder on its inability to properly administer data. With end users creating their own reports and accessing their own data, every effort should be made to avoid two users coming to different conclusions because of faulty data.

In general, it is not a safe practice to have end users directly access live operational files. Users should speak to the Information Center staff about the data they need. In many cases, the user's request can be satisfied using the current inventory of query files maintained by the center. If the request requires a new set of data, the user should then fill out a formal request. The center's staff should obtain the appropriate authorizations and arrange to have the data prepared as an extract file. Preparing the extract file includes ensuring the data is clean and current. As production systems develop and change over time, it is not unusual for certain data fields to become obsolete or to change their meaning.

For example, the number of work hours for exempt employees may, over time, have become a meaningless data item, even though the labor reporting system still puts a value in the field. Or data values may be in a format suitable for sorting purposes, but misleading to an uninformed end user. When a new extract file is created, it should comply with standards maintained by the Information Center and the data administration function of the installation. Once created as a clean set of data, an extract file can be added to the inventory of query files maintained by the center's staff. The query files should all have standard documentation that describes the data items and standard data formats.

Keep success stories flowing up to management and out to potential users. Successful Information Centers make an effort to keep themselves visible to their markets by pointing to their successes. It is useful to point to the number of user IDs, amount of computer resources used or volume of support calls answered. These are relatively easy measures of Information Center activity, and almost every installation we have spoken to collects and summarizes these figures on a monthly basis. The figures are evidence that activity is taking place, although they do not necessarily mean that useful activity is taking place.

More to the point, and much more effective, are case histories of applications end users have written themselves. These success stories should be publicized. One organization went so far as to rent a ballroom of a major hotel to stage a "trade show" featuring the applications of the Information Center users. In the two days the show ran, several thousand company employees attended and learned about the wide range of applications the center was able to address.

The Information Center concept has proven to be a valuable and important step forward. With the software tools available today and the greatly improved cost/performance ratios of hardware, many MIS departments have shown they can greatly improve the productivity of their organizations by putting the right tools in the hands of the right users. OA

Clarke is senior product manager for National CSS, Inc., a company of the Dun & Bradstreet Corp. Headquartered in Wilton, Conn., Clarke has frequently worked with users setting up Information Centers.

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The New Office: More Than You Bargained For

What's good for the organization may not necessarily be good for the employee. What can be done to help both?

By M. Lynne Marcus

Both users and vendors are interested in the impacts of office automation. Users want to benefit from OA while preventing resistance and disruption; vendors want to incorporate selling features into their designs while avoiding bugs. Although general agreement exists on the importance of the impacts of office systems, there is little agreement about which kinds of impacts are important.

Computer-based applications, which include OA as a special case, are believed to affect a daunting array of human and organizational characteristics. A partial list includes:

- Job characteristics.
- Job satisfaction and quality of working life.
- Psychological reactions.
- Health and stress.
- Organizational centralization or decentralization.
- Power and politics.
- Communication channels
- Employment.

Research has demonstrated that computer-based applications sometimes have impacts on these attributes. But the research is sketchy and leaves many questions unanswered. Its relevance to office systems is

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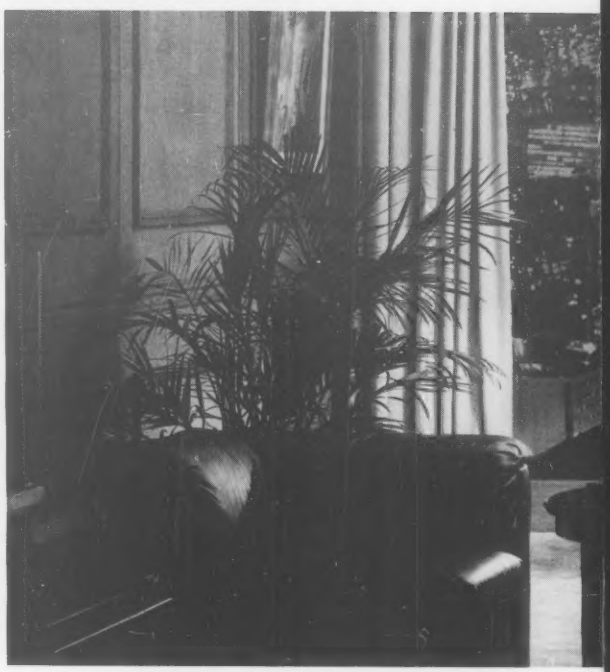

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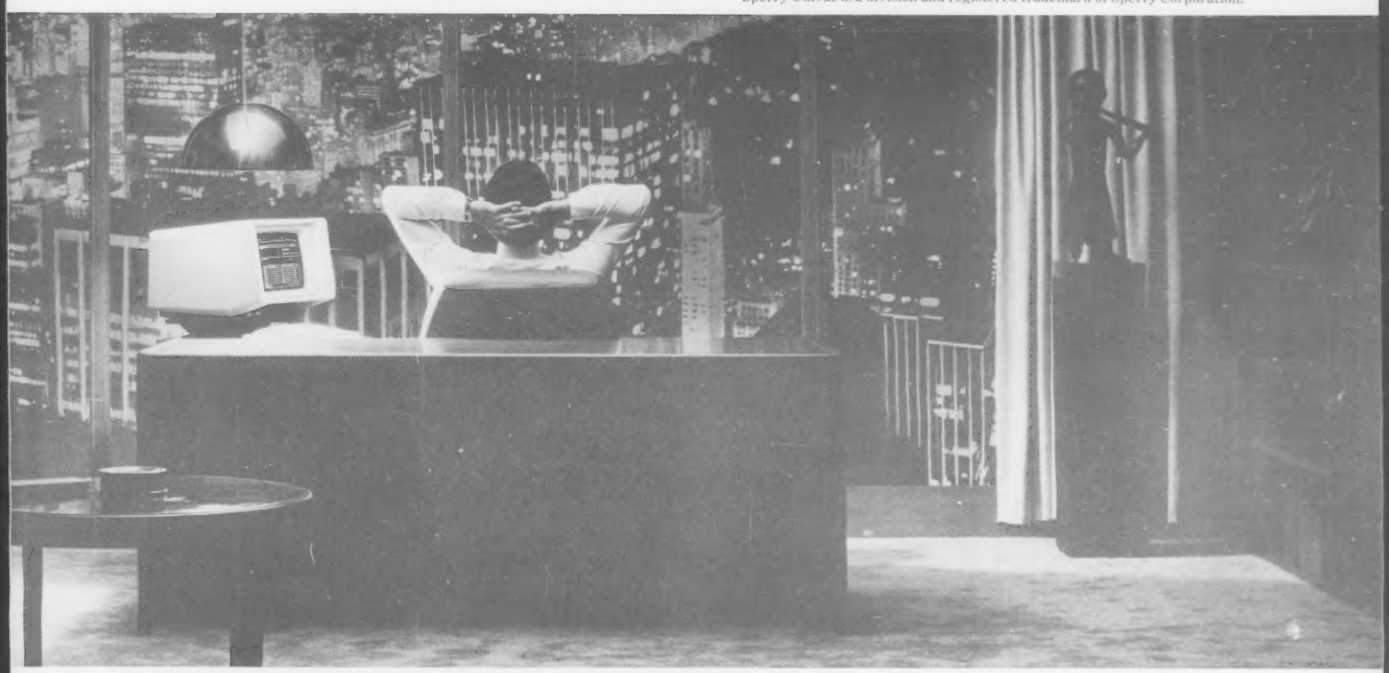

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data processing and personal computing. With the SPERRYLINK System, you can process, store, transfer, and gain access to virtually all the relevant information within your organization, ultimately tapping into the power of the mainframe.

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frequently unclear. Two conclusions do emerge, however:

• Office systems must be considered on at least two levels: their effect on individuals and their effect on the collections of people we know as organizations. It cannot be assumed that the effect of an office system on an organization will be the sum of its effects on individual workers. Nor can it even be assumed that a system that benefits individuals will benefit their organization and vice versa. For example, an office system may increase productivity to the point where the organization experiences a lower cost of sales and higher profit. At the same time, however, it may achieve these benefits with fewer workers, thereby reducing employment opportunities inside the firm.

• Office systems must be considered not just for their impacts on what people do when they work, but also for their impacts on how they work (and how they feel about this) and where and when they work. What people do when they work can be called the work task. Office automation is widely believed to make work tasks easier and faster, thereby contributing to organizational productivity.

But productivity is also a function of how tasks are distributed among people and how well people work together to accomplish them. This means that the social aspects of OA are as important as work task impacts. The social side of work results from people interacting in space and time. OA promises to alter these interactions by replacing synchronous with asynchronous communication. This dimension must be considered in addition to task and social impacts.

These conclusions yield a broad framework for examining the potential and actual impacts of OA (see Figure 1). Along the top are the three relevant aspects of organizational life: work task, social aspects and space and time. Down the side are the two levels of impact: individual and organization. Each of the six boxes contains at least one positive or negative impact which can result from the use of office systems. The remainder of this article will examine each area of impact in turn.

Job characteristics and employment: One of the most persistent claims for OA is that it reduces the length of time required to perform certain tasks — typing and revising manuscripts, distributing documents and so forth. Various benefits are expected to derive from this. The individual is expected to be able to perform the simplified tasks more often per unit of time or to be able to use the resulting free time for performing other delegated or self-initiated tasks. This increase in the productivity of individual managers, professionals and clerical workers is expected to spill over into greater organizational effectiveness.

Unfortunately, the expected benefits do not always materialize. In the first place, office systems themselves may absorb some of the time and attention they save. Most people would admit this is true during the process of training on a new office system, but, as Rob Kling and Walt Scacchi have noted, automated systems also seem to create recurring hassles for their users. Users of office systems may be unaware of the time they spend making back-up diskettes or creating parallel filing systems for hard copy and floppies, but the ongoing investments in time can be substantial.

"It cannot be assumed that the effect of an office system on an organization will be the sum of its effects on individual workers. Nor can it even be assumed that a system that benefits individuals will benefit their organization and vice versa."

In addition, some people may not enjoy the jobs that have been made "easier" by office technology. Jobs comprised of simple tasks, repetitively performed, are often made bearable only by the little things that slow down the unautomated environment — for example, having to lay out charts and tables by hand. By removing the need for thought, office systems may make some tasks more thoughtless, boring, fatiguing and, ultimately, error-prone.

This impact is compounded in

some organizations by a tendency to design jobs that are specialized in a single task. How many firms restructured secretarial jobs into administrative and typing roles when they introduced word processing equipment? In many cases, the jobs created in this way are not only boring, they are also dead-end in terms of career progression. To use an example from an older technology, the promotion possibilities for keypunch operators were never very great.

Jobs comprised of hard-learned professional and technical skills are also vulnerable to inroads by OA. Decision rules and expert knowledge can be programmed into systems, thereby "deskilling" the jobs and allowing them to be filled by less highly trained (and therefore lower paid) individuals. This can reduce job satisfaction, career mobility and even employment opportunities for high-level technical and professional workers.

Level Of Analysis	Work Task	Social Aspects	Time, Place
Individual	Job characteristics and employment	Autonomy and control	Work at home
Organization	Productivity and composition of work force	Communication network and power	"Small is beautiful"

FIGURE 1. Framework of OA Impacts

Productivity and composition of the work force: Increases in individual productivity do not always translate into benefits for the organization. One reason is that individuals may fail to use their new free time to organizational advantage.

A more important reason is that most tasks are group activities, not individual activities. Consider the process of producing a report. One person writes a draft, another types it and mails it to a third for editing. The document is retyped, reissued, revised again and so on. Improving the productivity of one individual in the report production chain — the typist, for example — is unlikely to have a noticeable effect on the productivity of the entire process. For this reason, organizational effectiveness needs to be considered quite apart from individual productivity.

Properly conceived and implemented office systems can produce remarkable improvements in the productivity of organizational processes. A research laboratory in an oil company was able to speed up production of its major product (reports) through the use of OA. Each professional (as well as secretaries and WP center typists) had direct access to powerful text-editing tools. Some of the professionals composed documents on-line, finding it no more difficult or time-consuming to combine the activities of writing and data input. Others sent their drafts to the WP center for key entry. But most would edit their own documents and electronically distribute them to the relevant reviewers. Reports got done faster and better than formerly, and professionals believed they received better secretarial support. At the same time, however, this laboratory significantly reduced the ratio of secretaries to professionals.

What occurred in this research lab is both paradoxical and highly significant. Contrary to the claims of major vendors, office systems at this lab did not take $10,000-a-year work off the desks of $40,000-a-year professionals. Rather, it did precisely the reverse. Professionals did more of their own clerical work, but they did not experience it as such, because automation made the tasks easy and increased professionals' control over the entire process. Automation did this by changing (in this case reducing) the division of labor — the number of people involved in performing an organizational process.

The flip side of this reduced division of labor could be changes in the composition of organizational work forces. Over time, fewer people may be needed to occupy specialized positions that are entirely clerical in nature. The indispensable jobs will be those that embody unautomatable professional and technical skills and knowledge. These people will use sophisticated office systems to capture and process data at the

point of origin; redundant handling by data specialists will be eliminated.

Over the short term, this may benefit organizations by reducing labor costs. Whether benefits will remain over the long term is unanswerable, but some areas of concern suggest themselves. In most organizations today, the ranks of professionals and technical workers are disproportionately filled with white males; the ranks of clericals and data handlers, with minorities and females. What happens if the lower level ranks contract? Will opportunities for employment and occupational mobility among minorities and women be reduced substantially?

"In most organizations today, the ranks of professionals and technical workers are disproportionately filled with white males, the ranks of clericals and data handlers with minorities and females. What happens if the lower level ranks contract?"

Autonomy and control: Work is not only or primarily an individual activity, it is also a social activity. Workers relate with their bosses, with co-workers on a specific task and with other individuals who share their time and place of work. OA has the potential to alter all these social relationships with far-reaching consequences for individuals.

Workers differ significantly in their social needs. Some prefer to work alone; others abhor it. But all workers require a measure of control over their own work. In order to learn and improve their performance, they need to see the results of their efforts and know when they are doing well or badly. Office systems can collect, summarize and report to the individual the data essential to monitor and control his performance.

However, office systems can just as easily report this data to someone other than the worker. In so doing, office systems can be used for control over people rather than for self-control.

Consider the ability of WP equipment to keep track of a typist's keystrokes per hour. One can imagine a novice typist using these statistics to gauge gains in speed from one day to the next. However, most systems that track productivity statistics do not make them available to the typist at all. Rather, they report them to a supervisor, who can then use them for external performance evaluation.

Too close supervision and too tight control over workers' behavior can result in stress, health problems and psychological reactions like powerlessness and apathy. Not only the quality of people's work life, but also the quality of their life away from work may be affected substantially. That automation increases the ability to exercise this control is clear from many published accounts. For example:

"Working at the [Traffic Service Position System at AT&T] terminal is easier than the old cord-board . . . This does not mean that operators have more control over their work; in fact, they have considerably less. With the cord-board, operators could regulate somewhat the pace at which they responded to calls . . . [The new system] means an operator can handle an unending succession of calls. There is no such thing as a full terminal.

". . . For half an hour, two times each week, every operator is timed by computer to determine her 'average working time' . . . Operators are evaluated on their 'speed of answer.' After the electronic beep, they have three seconds to respond to a call . . . Many still complain that the pace of their work has increased . . ." [Robert Howard, "Brave New Workplace," *Working Papers for a New Society*, 7, pp.21-31]

And, "Tuesday, 10:30 p.m.: The lone computer operator comes over to my console and says in a friendly way, 'if you're going to stay here, you'll have to get your productivity up.'

" 'Oh,' I say. 'What is my speed and what should it be?'

" 'It's been scientifically set,' he tells me, 'at 50,000 keystrokes an hour.'

"Then he sits down, plays a couple of chords on his control panel and up come my figures. The figures show — to the near-

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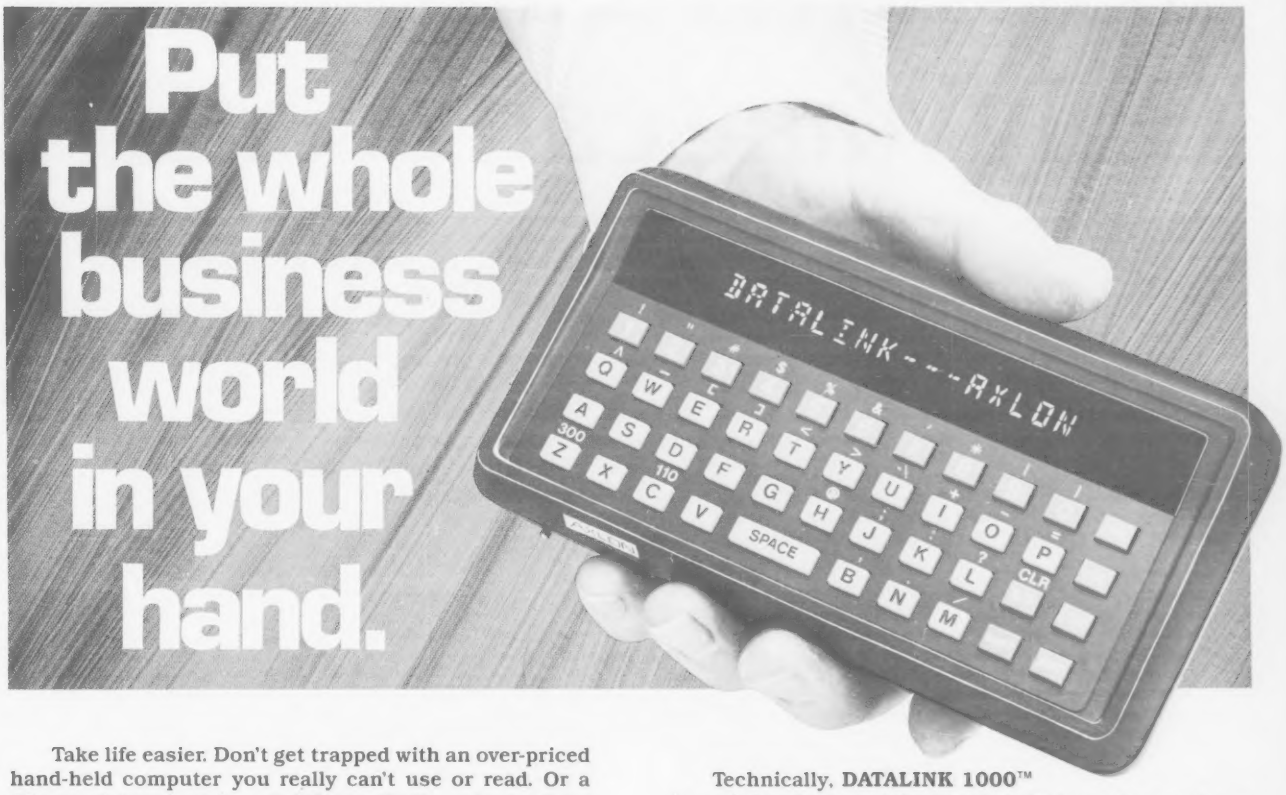

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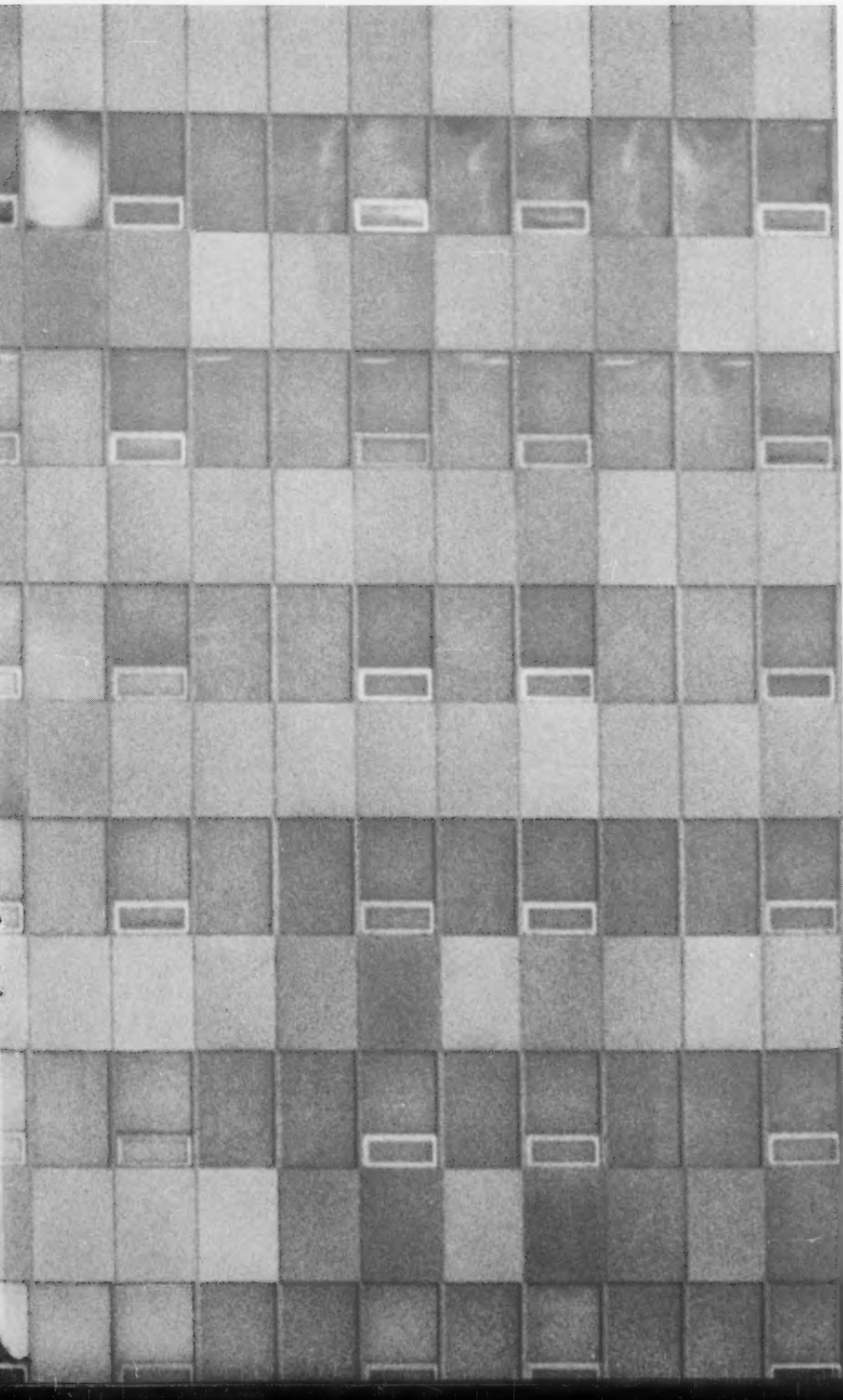

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est tenth of a second — when I started, when I took a break and exactly how many keystrokes I'd done all evening. (I am very far below the 50,000 keystrokes an hour.) The real supervisor is inside the machine." [Barbara Garson, "Overload in the Data Cluster," *This World*, June 28, 1981]

Sometimes excessive control over workers can engender resistance, misuse of systems and even crime by computer. Many examples could be given of these phenomena at work among managerial and professional employees, but my favorite example concerns office workers:

Industrial engineering methods were introduced into the office in the 1920s. In order to time-study typists, analysts fitted typewriters with mechanical dials that recorded keystrokes per unit of time. In *Labor and Monopoly Capital* (New York: Monthly Review Press, 1974), Harry Braverman points out that it did not take the typists long to begin using the space bar instead of the tabulator key to increase their stroke counts.

You'd think we would have learned by now!

Communication networks and power: Applications such as electronic message systems and computer conferencing are touted for their ability to improve the frequency and effectiveness of communication among people separated in space and time. Some studies are beginning to amass evidence that new office communication technologies encourage exchanges among groups that did not formerly communicate. It is easy to imagine how this might contribute to improved organizational effectiveness, for many examples are cited in the trade press.

The down side of this technology is more difficult to anticipate but equally plausible. In brief, controlling communications channels can give power to an individual or a group by restricting others' access to information or by selectively distorting the information transmitted. One way people and groups can currently maintain power is by laying out physical space to limit interaction (and therefore communication) with other groups. New communication technologies do not respect physical distance or organizational hierarchies. They allow and encourage each person to contact every other person. The result may be to undermine organizational power distributions and authority patterns.

IBM's Vnet offers an amusing, if sobering, example. Vnet is a network connecting 400 computer CPUs. IBM employees who use terminals in the course of their work can send messages to other terminal users over Vnet. The electronic mail capabilities of Vnet evolved almost accidently; IBM management did not plan or sponsor it. Today, however, Vnet could already be the world's largest electronic newspaper.

The designers of Vnet were working on a project that ran counter to the strategies pursued by IBM management. The people on the project believed strongly that it was useful, and they persisted in working on it after management disbanded the group and scattered its members to different geographical and organizational locations.

Vnet helped the group members to stay in touch with each other. Eventually, when they interested several customers in the product, they convinced management their idea was correct . Management reluctantly agreed to allow the product to be sold and earmarked funds for the necessary ongoing development. It takes little imagination, however, to guess that the leaders of the group had made themselves something less than popular with the authorities.

The result was that people working on the project have had ongoing fears about their career prospects; many of them have left to join other firms. As concerns within the project group grew, Vnet once again figured heavily — this time as a way for people to exchange gripes about management and about their uncertain situation.

"Vnet has been used, among other things, for personal attacks on IBM management, to send job resumes and even to announce resignations, sources say. But, they add, a steady flow of less sensational and more constructive criticism of IBM has also surfaced on the network during the past year. Memos passed through the network claim that [DP Division] employees are increasingly working without adequate tools or computing power and with little or no merit incentives or career prospects.

" . . . Several months ago, Wheeler [an IBM systems programmer] decided to package together some of the Vnet 'gripe mail' into a collection . . .

"According to sources, Wheeler then removed the names from the memos and sent a copy of the package to each of IBM's top executives . . . " [Ralph Emmett, "Vnet or Gripenet?" *Datamation*, Nov. 1981]

Work at home: Many futurists have predicted that increased use of office systems and telecommunications will herald an era when many of us work at terminals in our homes, eliminating lengthy, energy-consuming commutes and incidentally lowering companies' bills for rent, maintenance, utilities and furniture. Other writers have been less sanguine about the benefits of working at home for individual employees.

For example, people working at home may become isolated from the valuable social contact and socialization processes that occur in offices. Supervision will need to change and will probably be more difficult than it is in face-to-face settings. In addition, while some workers may value increased time with their families, others may find this interaction personally stressful and hindering in their work. Working at home can disorient people who have relied upon the physical separation of settings for clues about appropriate roles and behaviors.

Small is beautiful: Whatever the benefits or harmful consequences it has on employees, widespread working at home is bound to have impacts on the organization itself. These impacts are highly speculative, but should provide some food for thought to corporate and manpower planners.

A perennial issue is whether an organization should have its own employees perform an activity or whether it should contract it out to an external agency. Because they have the incentive to do so, external agencies often perform the activity more cheaply; they may also do a better job of it. However, organizations may hesitate to contract some activities out because they fear losing control or becoming dependent on the external agency.

When large numbers of people work at home, organizations may feel such reduced influence over workers that they become willing to abandon the employer-employee relationship and to assume the contractor-contractee relationship. Organizations may thus become small agencies that contract with any army of subcontractors and self-employed individuals for most essential services. This would certainly change the management of organizations and the nature of work for many people!

"The impacts of office systems do not result from the features of technology, nor from the characteristics of people and organizations. Rather, they arise from the way particular system features interact with a particular organizational setting."

The preceeding discussion of the impacts of office automation has had the flavor of the old good news-bad news joke. For every benefit of OA, a problem or negative impact has been identified or can readily be imagined. The bad news is that the benefits are not inevitable; the good news is that the negative impacts are not inevitable either. Things can be done to increase the likelihood of benefits and to reduce the chance of negative impacts. Unfortunately, the measures required go far beyond human factors engineering of office equipment and careful selection of system features.

The impacts of office systems do not result from the features of technology, nor from the characteristics of people and organizations. Rather, they arise from the way particular system features interact with a particular organizational setting. One consequence of this is that the same office system can have very different impacts depending on how it is configured and delivered in an organizational setting.

Configuring a system in an organization is a question of who gets access to it. For example, some firms have installed electronic message systems only for managers, when secretaries and administrative personnel are critical to the success of many organizational processes.

Another example involved the most successful use of WP technology I have seen. It occurred in a research lab that provided access to text processing software to all professionals, as well as to secretaries. Access to a system is one of the design variables by which office system impacts can be influenced and controlled.

Delivering a system in an organizational setting is a question of the procedures in which a system is embedded. For example, the organization of secretarial support services will be instrumental in achieving benefits from WP technologies. Secretarial services may be centralized, decentralized or distributed; they may be specialized, unspecialized or mixed.

Another example of this influence are common procedures across departments for indexing and filing documents, which can be instrumental in the success of search and retrieval systems. The procedures in which a system is embedded constitute a second major design variable for influencing and controlling office system impacts.

The bad news is that designing appropriate procedures and access patterns is hard work. The good news is that it pays off in benefits from office systems. OA

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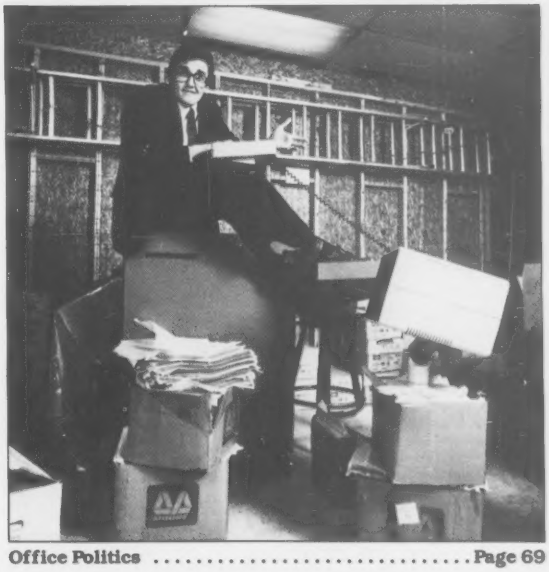
OA FOCUS:

PLANNING OFFICE STRATEGIES

Office automation will eventually have an impact on almost every organization. But if allowed to develop haphazardly, automation may never achieve its purpose — increased productivity. "OA Focus" looks at how and when to plan, when pilot projects may achieve quicker results, how to use office politics to your advantage and other planning strategy tips. In each issue, *Computerworld OA* will spotlight a new topic or technology in "OA Focus" to help you keep pace with the industry.



FOCUS

Plan! Don't Plan!

Two approaches are open in OA — strategic planning and pilot projects. Which one (or combination) to use depends on your need.

By J.T. Monk and Kenneth M. Landis

If the portfolio of systems, tools and technologies that comprise office automation is to be applied correctly, organizations should implement a strategic OA plan. The plan not only includes long-term hardware and software considerations, it also establishes the management foundation for the organization's information structure.

A major factor in the successful use of OA technology is a commitment from top management. Anyone who has the money can buy a computer system, but transforming raw processing power into a business asset requires top-level commitment. Moreover, this commitment must come in two forms: first, the acknowledgment that information is a valuable corporate resource that must be managed with the same intensity as a cash asset; second, a willingness to devote the financial and human resources necessary to

(Continued on Page 48)

By N. Dean Meyer

Many organizations begin their office automation programs with an organizationwide study and a strategic plan. Yet evidence suggests this is not the most effective way to get started.

Evidence comes from three sources: case studies of leading-edge user organizations, research on effective management strategies and the experience of prior innovations. All three converge on a more evolutionary approach.

Large organizationwide studies and strategic plans seem to be a poor starting point for a number of reasons. They require the expenditure of significant money and effort prior to showing any results. At the same time, they do little to build the credibility of OA professionals or to initiate momentum in the organization.

Furthermore, organizationwide studies may lead an OA staff group to focus on less-than-optimal areas.

(Continued on Page 50)

(Continued from Page 47)
integrate and adapt the technology to the organization's needs. The commitment to OA must begin with the chief executive officer and end with the individual users.

Many DP and line executives argue that OA technology is too complicated for a majority of their potential users; others believe the industry must mature before a capital investment is made in equipment that may be quickly outdated by new products. Neither concern should be a deterrent. The OA industry has matured to a point where investments in various functional technologies will yield a significant positive return and should be made.

Strategic planning provides the direction and identifies the decision criteria necessary to select and implement OA technologies. Strategic planning addresses the concerns of management and increases the awareness and comfort level of those involved in the automation process. It structures the OA decision. Alternatives are assessed on their respective merits, not on their technological sex appeal.

A discussion of some of the long-term issues follows.

Connectability: A long-standing problem in information systems is that different manufacturers use different interface methodologies to link their equipment. This situation is caused by the technical requirements of various systems and explicit market segmentation efforts by the vendors. The result has been high software and network maintenance costs.

The connectability problem is particularly severe in office automation; all operating units require a telecommunications capability. Communications functions are often embedded in the hardware/software configuration chosen or in the organization's existing DP/networking equipment. Incompatibility severely affects the overall value of the OA system by artificially limiting its uses within the organization.

Standardized Workstation: The only "standard" workstations produced by the industry are serial character-by-character transmission Ascii workstations. Many workstations are not able to support the full Ascii character set. The limitation imposed is that they may not be fully compatible with future generations of OA software. Furthermore, if the organization decides to install an OA system that is not compatible with its existing workstations, the write-off and new investment costs of acquiring compatible workstations may cause an otherwise sound decision to be blocked or deferred.

Varying network protocol standards also reduce software and hardware transportability. The native communications mode may be vendor-dependent, which limits the organization to that particular vendor's OA solutions. Those solutions may not be the best way to solve the company's problem.

Brute force compatibility can be achieved through the use of protocol translators, which enable diverse native technologies to communicate. Although these translators are viable products, they increase the cost and complexity of establishing and maintaining an OA network.

Single-Vendor Equipment: Contrary to some marketing literature, there is no single-vendor OA solution. The vendor that has everything for office automation simply does not exist.

Security: An automated office system must incorporate a level of information security the same as or greater than that used in the previous manual system.

Organizations should take advantage of the opportunity presented during the planning process to develop a security plan. A security plan designed and instituted after the planning and implementation process is complete will result in unnecessary expenditures. Without a cohesive security plan in place, the organization runs the risk of degrading its internal controls or compromising sensitive information.

The Human Interface: The introduction of technology within the office often creates more fundamental problems. For example, OA technology will change the flow of work and information within the office. These changes affect the informal, if not the formal, organizational structure, and these structural changes impact individual job characteristics. In addition, the way in which the work itself is accomplished is changed; personal and managerial styles are forced to synchronize with the technology. Management must be apprised of these potential impacts and be prepared to deal with them.

The introduction of OA will affect the components of the office's environmental design: lighting, air circulation, noise control measures and office fixtures. These environmental needs must be recognized and addressed.

The dynamics of office life — interpersonal communication and the office's social hierarchy and order — are affected by technologies such as electronic mail, voice mail and telecommuting. The social order of the work place literally changes overnight, and an organization must be prepared to deal with these potential changes. One method is employee sensitivity training: Allow the employees to become familiar with the technology before it appears on their desks.

Top management must prepare a plan that outlines the steps required to implement the organizational information management goals. The plan must address the assimilation of existing technology into the office plan. Emerging technologies whose availability can be reasonably forecasted should also be included.

The last 15 years have taught us that the technology of information management changes constantly. To accommodate this evolution, a strategic plan can be critical. The plan provides a direction for orderly growth and minimizes the impact of information and technological change.

Three basic principles are clear: An organization's information resource must be accessible; the information processing devices must be interconnected; and, finally, the individual user's needs must be met.

Strategic planning for OA requires a systematic evaluation of the business, and the planning criteria include corporate goals, objectives and available resources. A successful planning process is accomplished by means of a phased approach. The result of an OA strategic planning effort should be an integrated model of the organization's information needs, the generic software/hardware configurations that fill those needs and an analysis of the corporate resources requires — such as personnel, capital and time.

After an organization has made the decision to commit to OA, five phases of action follow:

Phase 1 involves a detailed review and analysis of the business' internal and external environment, including current and evolving business strategies, goals and objectives, performance, problems, issues, strengths and weaknesses. The automated office must be assimilated by the business, not grafted onto it. Critical success factors are identified to provide a system of checks and balances as the business evolves. The plan helps direct the business' energies and defines its OA plans.

Phase 2 identifies the architectural requirements of the automated office, including hardware, software, telecommunications and functions. After reviewing the current state of the art, the planners can match their company's information needs to the available technology.

Phase 3 addresses the issues of organizational capacity and resources from both a human and a financial perspective. This multidisciplinary approach identifies the impact of technology in both qualitative and quantitative terms. Each component of the office system should have its financial and personnel impacts analyzed and these should be related to the appropriate business strategy and the total corporate structure.

Phase 4 defines and establishes direction and timing parameters for the detailed implementation plans. Consideration should be given to such factors as financial posture, managerial expertise and staff availability. Once activated, the implementation plan coordinates the introduction of the OA systems.

Phase 5 is the continuous process of managing the evolving environment. This phase demands a continuing effort on the part of the organization. As external and internal environments change, the planners must fine-tune the strategy whenever necessary. Should one or both of these environments change drastically, a major overhaul of the plan will be required and should be made.

Strategic planning provides the framework for the integration of office technologies to increase the efficiency and productivity of the work place. Effective planning must be accompanied by organizational commitment and involvement. Without this vital element, the technology is useless.

Office automation could become as important to an organization's future health and well-being as the success of its products. The strategic plan is the key to OA success. OA

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Monk is a manager in the St. Louis office of Peat Marwick. Prior to joining the firm, he worked in several departments of a large manufacturing corporation.

(Continued from Page 47)
Because they are highly structured, large studies chart administrative applications well. This may identify opportunities for cost savings. However, large studies are of limited depth, and they tend to miss the higher payoff managerial and professional opportunities.

Organizationwide plans may in fact be dangerous. They encourage top-down design of large systems. This approach worked well for well-structured DP applications, but not for OA. Large top-down system design projects risk large expenditures of time and money before they show results. Because they must be relevant organizationwide, they address only the less critical administrative functions common to all users.

High-payoff applications are those that directly address the business mission of a user group and are unique to each user group. Furthermore, because the tools have great impact on the way people work, change must be carefully managed in each new application. To attain significant improvements in management productivity, an incremental evolutionary approach is required.

Organizational studies and plans do indeed have a role, but they are generally more effective a bit later in the process.

At the beginning of an OA program, the challenge is threefold: to build a capability to deliver OA applications; to initiate evolutionary momentum through pilot applications and to plan for technology integration and support.

The starting point is to identify responsibility for OA somewhere in the organization. Task forces can do studies, write plans and raise the issues, but they seldom follow through with implementation and ongoing support. Cursory studies of the total potential of OA in the organization may help get management attention and justify establishing an OA group. Management awareness presentations at a high level may also help. Research offers clear guidelines on chartering and staffing an OA group.

To further prepare the OA group to support users, they must be trained in the broad range of tools and technologies and in managing implementation projects. The most powerful way to train the OA staff is through the experience of a "builder pilot." The OA group should use the tools they offer to others.

The next challenge is a diffusion plan that analyzes how OA will spread through the organization. New ideas seem to diffuse through organizations in fairly consistent ways. Pilot locations can be selected by balancing business need, the influence of user opinion leaders, the user climate for change and the relevance of the technologies under consideration. At this stage, one is seeking just a few pilot opportunities with significant payoff in the right places in the organization.

Having covered these bases, the OA staff can then start to build credibility and momentum through implementing pilots for these opinion leaders. They need not start with any one technology (such as word processing or electronic mail); any starting point will evolve toward the same integrated systems in the future. Early pilots should select tools based on the business problem of concern to selected users.

Implementing pilots before a plan is written risks technical chaos. However, the top-down approach risks no progress.

Implementing pilots before a plan is written risks technical chaos. However, the top-down approach risks no progress, a fate far worse than future technology patches. Early pilots can be designed to ease later integration by focusing on established vendors' available technology that is flexible and can communicate in standard ways.

It is of utmost importance that these early pilots be very successful. Dramatic returns are possible, similar to those of the early days of DP. However, the issues of change are also particularly significant at this stage of growth. Success requires careful management of the people issues and the active and meaningful involvement of end users. End-user training and workshops are powerful ways to initiate involvement. A variety of project management methodologies are then available to structure user participation.

The results of early pilots should be documented to be able to advertise a success. This measurement should demonstrate

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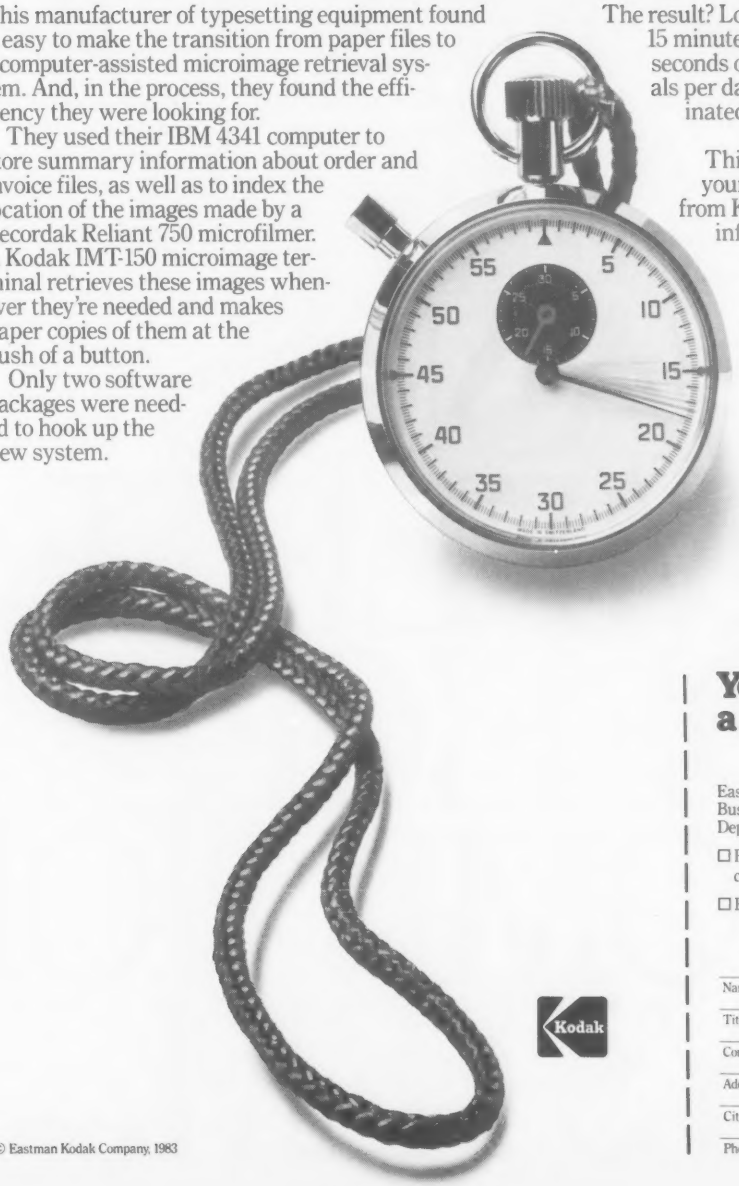

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INTERRUPT	YES	**NO**	**NO**
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more than administrative cost-efficiencies. To be relevant to business managers, benefits should be expressed in terms of the users' mission and objectives. There are a variety of ways to evaluate managerial and professional productivity and effectiveness, all related to the specific context of the application.

At some point, more organizational commitment is required — in the form of budget, staff and widespread involvement in a strategic planning exercise. A rough scoping of the total potential may at this point be based not only on analysis and others' experiences, but also on the early pilots. The OA team now has evidence of the benefits of a few applications in the context of their unique organization, and it also has powerful allies in the user community. These make a far more convincing argument for resources than might have been made only a few months earlier.

Strategic planning is a political event in itself. It builds widespread awareness of the potential of OA and of its cost. Thus, the strategic planning exercise should wait until the OA staff is ready to respond to the interest generated by this exposure and the questions it will raise.

An OA plan is more than a technology forecast. It must also consider future business needs, the broader business environment, the pace of organizational change, staff support requirements and investment strategies. OA planning should not be done by staff groups alone.

The planning exercise may be used to involve a cross-section of senior managers in thinking through the potential of OA for their business. Users can be guided through a process of describing future functionality based on business needs and directions. This should result in the identification of needs and applications of far greater relevance than "expert" systems analysis.

After the functionality of future systems is described, technical staff can design the infrastructure that, by its nature, must be built top-down. Staff can also develop and refine policies and guidelines for pilots, personal computers, word processors and so on. These guidelines should leave room for local tailoring and user involvement, while ensuring long-term technical integration.

The technical design of the infrastructure and guidelines for pilots can be based on an analysis of the range of tools in the integrated office of the future and what tools and information fit best at what level in an organizational network. This future network will accommodate personal computers, group computers (such as word processors), establishment computers (such as the private branch exchange), organizational computers (for example, management information services) and public time-sharing. Each has unique attributes and has a unique role in supporting the range of OA tools.

Planning is an ongoing process. A plan is not a fixed document, but rather a moving target. It should be updated on an ongoing basis to reflect changes in business directions and needs as well as technology developments. After the first plan is written, a regular planning process can be installed. At this point, user councils and end-user training programs may be formalized to ensure continuing involvement.

"A strategy of pilots before plans risks minimal investment of effort and money up front and delivers business benefits early in the process."

A strategy of pilots before plans has numerous advantages. It risks minimal investments of effort and money up front, while delivering business benefits early in the process. It retains a business-need orientation and focuses attention on managing the process of change. It builds a healthy relationship between users and OA staff. And it provides for technology integration without locking the organization into large monolithic systems development efforts.

This evolutionary strategy is quite different from the standard approach to information systems planning. Many successful OA managers have found this evolutionary approach more pragmatic, even if a bit less logical.‡ OA

Meyer, an OA consultant specializing in managerial and professional systems and applications, also hosts discussion groups by teleconference. He works from his "electronic cottage" in Ridgefield, Conn.

FOCUS

Survey The Field

How are OA implementors executing their strategic plans and what do they include? A survey reveals how other planners are coping.

By John M. McQuillan

PHOTO ©1983 ED BRAVERMAN

Many organizations are developing a formal strategic planning process for office automation. They are spurred by the belief that this planning function should be analogous to the strategic business planning activity and to long-range planning for computing and communications. In fact, in several forward-looking organizations, computing, communications and OA all report to a single information services manager who has ultimate responsibility for planning in each area and for integrating the plans.

Much has been written about the need for planning and integration and about the right planning methodology, but very few organizations seem to have an OA plan today. In a recent survey, 37 organizations had an OA strategic plan, architecture or specification, but many more organizations did not yet have their plan finished or even started. The following reports on some of the findings.

What did the plans in the survey look like? Variation occurred both in the planning process and in the resulting outcome. However, a pattern did emerge. Four types of OA plans appeared:

• **Strategic Plans.** These are also called long-range plans, five-year plans, statements of direction or blueprints. They are primarily concerned with establishing the scope and purpose of OA within the organization — what it is, what it is not and why.

• **Specifications.** These may be called checklists, functional requirements, requests for information and so on. Some are very broad, covering many technologies; others are limited to one or more key areas. These plans are statements of the organization's technical requirements.

• **Requests for proposal (RFP).** Normally, RFPs are not considered to be plans in the conventional sense of the word. For many organizations, however, the RFP is the only formal statement of the direction or technical requirements, so it is the plan!

• **Cost-justifications.** These internal documents, such as funding requests and capital approval requests, are required by most organizations when a major sum of money is to be expended in a new area. Like RFPs, cost-justifications are not conventionally classified as plans. Again, in practice these reports have often included the only formal statement of why an OA pilot is being proposed, who will be involved and how it is anticipated that the benefits will outweigh the costs.

Many OA plans begin with an assessment of the present organizational and technical setting into which new technology will be introduced. This assessment then leads to considerations of why the new technology will represent an improvement — an area in which most plans are weak and fall back on generalizations of white-

collar workers. Not all plans are weak in this area, however. A major government regulatory agency put together a very convincing argument for office automation based on the clear historical trend toward an ever-increasing work load at the agency, both in absolute terms and per staff member. This driving force, they pointed out, is compounded by new pressures to cut costs and to reduce the head count in the agency. Finally, the plan showed how OA could be viewed as an extension of the established strategy of increasing computerization of all agency functions. In short, this organization demonstrated that it is asked to do more each year with fewer people, and the only way to meet its stated mission is to automate.

Another important common feature of well-written plans is that they contain a succinct statement of direction. This may take the form of a call to action if the direction is currently lacking, or it may simply be a restatement of the consensus view formed over the past few years of experience. For example, the major recommendation made by a major industrial research and development facility was that office computing should evolve away from present mainframe solutions toward personal computers on a local network. One benefit of such a clear statement of strategy is that it makes it possible to identify counter-strategic developments and to try to slow or stop them.

Sometimes the statement of direction must be broadened to include different themes for different sectors of the organization or for different levels in the hierarchy. For example, the R&D facility distinguished between management functions (such as electronic mail, calendar, tickler and administrative computing) and scientific and engineering functions (keyboarding, editing and technical computing).

Finally, many of the plans reviewed in the survey were in agreement on the reasons for planning in the first place. They cited three major motivations:

• The pace of technological change and the growing number of vendor offerings, which put a premium on a coherent approach to office technology.

• The need to avoid proliferation and incompatibility.

• The need to get the full potential benefit from the OA investment.

It is clear that these organizations view their plans as the necessary first step in establishing the framework for subsequent management controls.

Nevertheless, even the most thoughtful plans were incomplete in one way or another. This is not surprising, considering how new office automation is and how difficult it is to plan well for an activity without several years of operating experience.

This, of course, is one of the basic paradoxes of planning. What are the problem areas in which we need more experience in order to plan better? Some of the more important technical areas that emerged from our survey included:

• Integrating the electronic office with the paper office.

• Integrating voice and image processing.

• Ensuring security and privacy.

• Converting software and operations from mainframes to personal computers and how soon that conversion should be accomplished.

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Some of the most difficult questions of all are actually management issues:

☐ How can OA be cost-justified?.

☐ How does an organization choose between specialization and standardization?.

☐ What should the right accounting, chargeback and investment policies be?

☐ How can a a flexible growth policy be established to avoid the worst aspects of proliferation, but employ new advances?

☐ How can success be measured in a pilot or in full operation?

☐ Who should be in charge of OA, or planning for it or implementing it?

Of course, many other very important problems seem to be common to most organizations, but this short list provides a glimpse at the size and number of difficult basic questions raised in the planning process.

In our survey, the most frequently cited reasons why people had not yet formulated their office automation plan included some rather familiar refrains:

• "I don't have time for all my day-to-day responsibilities and the crises that come up, so how can I find time for planning?"

•"Planning is too complicated — I'm not a planning expert and I don't want to be one."

• "We can't do an accurate forecast for the next six months, and you want me to do a five-year plan? What's the point?"

• "We're doing just fine without a plan."

• "We don't need long-range plans, we need short-term profits!"

There may be some truth to these statements, but much more is probably going on here beneath the surface. Much of the resistance stems from underlying factors. For example, in one large financial organization, planning forced people to look into the future, which they found threatening and confusing because of all the changes in the industry.

Invariably, a new plan changes information flows, decision making, power structures and so on, and it highlights conflict within the organization. And, finally, many managers got where they are today by being good at producing short-term results, not necessarily by doing conceptual thinking about long term issues. They are often unfamiliar with the whole process of strategic planning and with its benefits.

Our survey respondents cited some very interesting payoffs from their planning work. A clear majority said the single most important factor for OA success is not the best technology, the lowest cost or the fastest return, but rather planning, direction and management control. Planners at a major insurance company told us they felt it was much more important to select the right group of people for their electronic mail pilot than to select the right electronic mail product.

To put it another way, almost any plan is better than no plan at all. Several other sayings come to mind: "Plans are nothing, planning is everything." As the senior executive of a Fortune 500 corporation put it, "Planning is the cure for presidential insomnia!" There is no question that it is cheaper to plan than to implement and that more alternatives can be considered — and in a broader "system" context.

There are also personal advantages for the individuals involved in the planning process, who are often staff members in the management information services or DP departments. They report that it is an excellent natural channel for the involved parties to communicate about objectives, strategies, technical alternatives and expectations. These planners found it to be an invaluable learning experience, which gave them exposure to a broad set of issues and brought them into contact with many members of the top management team.

Several hard-dollar savings were cited as a result of putting the plans into practice. One diversified industrial organization achieved significant savings from quantity discounts on volume purchases of products. Without the plan, the volume would have been due to proliferation of different devices.

An insurance company cited another major benefit: Training costs, which can be quite substantial, were lowered because of fewer device types on which to train people, better in-house expertise on those systems and less need for cross-training or retraining when people were transferred. Finally, substantial savings resulted from reducing or eliminating the use of conversion devices and services and outright rekeyboarding and manual conversions.

Although very few organizations now have formal plans for the automation of their offices, a marked trend does exist in this direction. As users gain experience with the many different aspects of office technology and how it affects organizations, they will be much better able to plan for the future.

The pioneering firms surveyed here help show the way. OA

McQuillan, a consultant based in Cambridge, Mass., assists vendors and users of OA and communications systems. Formerly president of BBN Information Management Corp., he was also involved in the development of the Arpanet packet-switching network.

Step-by-Step Guide to OA Planning

The survey convinced us that, although each organization must make its own plan, plans share many common features. The following is a simple planning framework or outline that almost everyone can adopt:

1. Strategic Planning
   - 1.1 Executive Summary
   - 1.2 Assessment of the Environment
   - 1.3 Driving Forces
   - 1.4 Statement of Direction
   - 1.5 Strategics and Policies
   - 1.6 Recommended Approach
2. Architecture Specification
   - 2.1 Executive Summary
   - 2.2 Requirements Analysis
   - 2.3 Situation Assessment
   - 2.4 Architectural Design
3. Systems Acquisition
   - 3.1 Executive Summary
   - 3.2 Selection Criteria
   - 3.3 Functional Specification
   - 3.4 Technical Specification
   - 3.5 Evaluation Methodology
   - 3.6 Cost Justification
4. Pilot Implementation
   - 4.1 Executive Summary
   - 4.2 Selection Methodology
   - 4.3 Pre-Pilot Analysis
   - 4.4 Management of the Pilot
   - 4.5 Post-Pilot Analysis

FOCUS

Develop New Strategies

Things are changing for the MIS manager — sometimes too fast for comfort. Where do you start and how do you keep pace?

By Richard Dalton

PHOTO © 1983 ED BRAVERMAN

The concept of widespread office information systems is at least 10 years old. It hasn't been an easy decade for MIS honchos. Distributed processing (especially if it could be limited to remote job entry) was OK, but then the dam broke: Personal computers, applications generators, teleconferencing and missionary projects like "Information Centers" helped compound the difficulty of running the data processing factory.

The aggressive information systems head may have already realized the truth about this era of change — we are near the bottom, not the top of the learning curve. Less ambitious types may agree with a DP vice-president who recently described his future role as limited to "maintaining a clean data base."

The newest challenges come in areas largely divorced from traditional systems technology. While juggling the ongoing mainframe work load, MIS departments are also being asked to respond to a

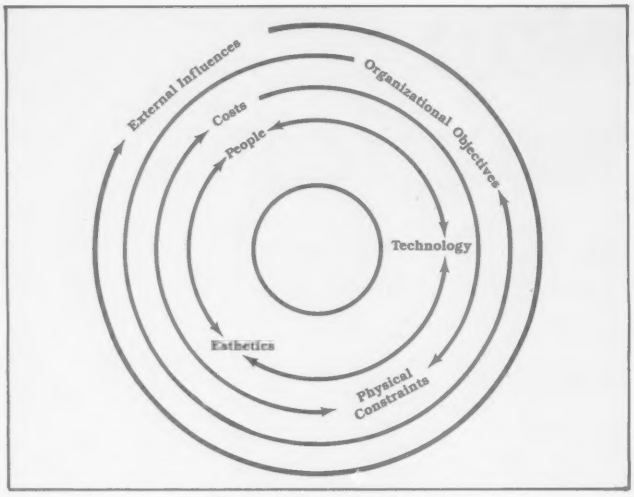

Figure 1. Planning Factors

plethora of requirements that focus on the emerging electronic office. These include:

• ***Advanced Communications Facilities.*** Everything from satellites and cellular radio to cable television. Even worse, it's not just neatly codified data that is being pushed down the line. Voice store-and-forward, text from incompatible word processors and even video signals complicate things.

• ***People.*** Instead of a remote "here's-the-report-you-requested" environment, a flood of personal computers and terminals is providing office workers with tools they often marginally understand but that have the capacity to obtain information directly from large-scale systems. Training, counseling and controlling an ever-increasing population of personal-computer-equipped users is now critical.

• ***Facilities.*** These are a totally new concern. Where do you put all those local network cables? How do you respond to questions about optimal ambient lighting for CRTs or ways to suppress static electricity in the office or to control equipment noise and vibration levels?

In truth, these new, interrelated concerns are probably more than one person, department or set of skills can deal with effectively. If the issue is the organization's success (and it ought to be, as opposed to empire building), a comprehensive effort involving key decision makers from MIS, administration (now sometimes called facilities management) and telecommunications is a prerequisite.

Organizationwide systems planning has always been needed. The added considerations related to office-based information systems make this planning imperative.

Whether it's comfortable or not, the office systems phenomenon represents a permanent change. Video games may be a fad, but office systems hold too much promise to be regarded lightly. Even more important, they will not be static, one-time considerations — any more than an IBM 360 was the last computer anyone would need. The net result is an ongoing process that will continue to evolve as better computer and communications capabilities present themselves.

Avant garde office workers who bought their own Apple IIs from Apple Computer, Inc. a couple of years ago are now lobbying for IBM Personal Computers and Fortune Systems Corp. micros. Complex software, electronic mail and on-line information services are being championed. As communications improve and portable systems mature, we will begin to see people abandoning their offices and commuting habits (at least part-time) for Alvin Toffler's "electronic cottage." Early work-at-home trials look promising for many knowledge workers.

What is this going to do to the brand new 40-story tower the company just completed? How do you arrange space to accommodate people who need an office only two or three days a week? How much telecommunications capacity will you need to service the stay-at-homes?

Since those are only a small percentage of the questions that must be dealt with, systems planning can be viewed as an ugly, if not impossible task — certainly one that you could comfortably put off until current, more familiar problems clear up. You do so at your organization's risk.

It is always easier to work from known information into the unknowns. An amazing number of large MIS departments have a very muddy view of the applications that are operational, in development and in the queue. Ditto for current and planned capacities, especially if you include the variety of small "pirate" systems already in place.

But the initial survey of where you are now cannot end with information systems if you are to create a plan that can deal with the future expansion of electronics throughout the organization. You need to look at the whole organization: what it does, how it communicates, how it relates to the outside world, what its objectives are and where expenses are allocated and profits generated.

That is certainly a major task, but an unavoidable one if you want to do more than guess at future impacts and fumble ahead hopefully.

You must also include an assessment of available technology and likely future directions. That, however, is a job that a lot of people want to do. It is the initial task, creating a model of the organization against which to test the future, that usually lacks volunteers.

Some unusual considerations have been brought up as well, such as the effects on the office facility itself and the people housed there, as we proceed with a deployment of technology. These issues need specialized skills that are generally not available internally, even in large organizations, and must be acquired from outside consulting groups. Professionals with experience in space planning and design, industrial hygiene and even behavioral science can contribute to an expanded planning process.

Planning office space has always been a challenge. You have to deal with compromises involving budgets, achieving the "right" appearance and helping people work together effectively. Very often, time is an overriding constraint as well.

The electronic office we hear so much about adds many new considerations, and the most important of these is the need to anticipate change — not as a set of predictable factors (like planning on a 10% increase in staff), but allowing for change itself. The problem is, we don't really know what will happen to office workers and their organizations if we install a personal computer on each desk, create an extensive videoconferencing network and/or make voice mail available throughout a building.

There are a number of theories about what you can expect from each of these changes, but they have not actually happened enough for you to extrapolate how they will impact your own organization. The best thing planners can do at this point is develop an approach that can adapt to a relatively unpredictable future.

Figure 1 shows the factors that need to be juggled. The importance of each one can only be evaluated in the context of an individual organization's needs (which tend to change over time),

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hence the requirement for a broad, ongoing planning process that recognizes the realities of shifting priorities. That's a major commitment of time and resources and needs support from the highest levels in any organization.

The lack of systems planning has always been a hindrance to developing information resources that provide the best support for an organization. In the past, however, most MIS departments have done a reasonable job of meeting most urgent and longer term needs. But past performance isn't good enough. That performance was related to highly centralized, batch-oriented systems. Office systems are wildly decentralized and unforgivingly real-time. They are also changing on a schedule that can cause vertigo in a 20-year DP veteran.

"Poorly considered systems can have highly leveraged (organizationwide) results much more severe than early DP errors."

There is too much risk to allow office systems to evolve organically. For all the recent price reductions, we are still looking at capital expenditures for office systems measured in tens of millions of dollars for large organizations. More important is the potential impact on other costs (office space, for example, now runs $3,000 to $12,000 per year per employee in metropolitan areas) and the effectiveness of the most critical element, the office worker, which can be improved or ground down depending on the support system decisions that are made.

This comes down to an authentic bet-your-business environment. Well thought-out office information systems can give organizations major competitive advantages. Poorly considered systems can have highly leveraged (organizationwide) results much more severe than early DP errors like the legendary incorrect billing problem. Unplanned systems leave the outcome to chance and responsible MIS executives should not feel comfortable with that avenue.

While technology is the driving force, an effective information systems plan needs to emphasize people, physical facilities and organizational structures. Miles of computer industry newsprint is consumed by arguments for and against 8-, 16- or 32-bit microcomputers and these concerns have little relevance unless your planning is based on people and the organization.

The skills needed for this new kind of broad-scale, integrated planning implies the creation of a multidisciplinary team of experts and a consummate administrator to keep the group of specialists on track.

The importance of this planning approach is becoming evident as early "office automation" projects provide questionable returns. The real value will be more evident as we see the less obvious, "downstream" effects of office information systems: for example, how the "less-paper" (not paperless) office will affect expensive space allocated to files and libraries; the impact of electronic transactions in banking and purchasing on office staffs; and wholesale redeployment of support personnel as their functions are assumed by electronic systems.

New communications technologies can even reduce the amount of time managers spend in meetings — and, one hopes, the office space reserved for conference rooms. And as all these changes take place, much more time will be devoted to training, employee evaluation and the matching of talents to new job requirements. Even our traditional hierarchical management style appears due for a change to a more open, networked approach suited to the advantages offered by these systems.

It is probably optimistic to describe the 1980s as an era of great challenge and opportunity for MIS people — more often the result will seem to be hard work with little assurance that the chosen direction will work for the best. The opportunity is real, nonetheless, and will be seized by those who can keep one eye on present realities and the other on a very shifty future. CA

Dalton is president of Keep/Track Corp., a Corte Madera, Calif., consulting and research firm that specializes in office-based information systems.

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FOCUS

Don't Forget Politics

Not just a necessary evil, politics can win friends and influence people, particularly when you introduce change in an organization.

By Kate Barnes

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Imagine this setting: Managers from the SMI Co. are considering two office automation proposals. Proposal A is justified by hard figures. Proposal B is sketchily justified. Proposal A will not be approved; instead, Proposal B will be given the go-ahead. Why? Insanity? No, politics.

Proposal A was for a teleconferencing system designed to reduce travel. Top management, however, didn't want their travel reduced, so the concept was scrapped. Proposal B, sponsored by an influential middle manager, was for a marketing support system that had the overwhelming support of the approval group. It passed because the right people were convinced it should. The technology is here. Why, then, isn't it fully exploited? If you say something like, "John, over in administration . . .," you're talking politics. Politics is the process of building coalitions and using influence when existing procedures don't resolve differences.

Politics often carries a negative connotation. Yet, it is a reality and is present any time two or more people work together. An OA system aimed at building a data base is a political act if it results in the redistribution of data. Such redistribution can affect evaluation, authority, autonomy and communication. It isn't surprising when people react politically to an OA staff member's job of building a data base, for instance.

Politics is not played by managers alone. Anyone whose status quo is about to be disrupted by OA may become political. Office automation affects jobs, territory, authority and influence — all political commodities. The greater the change, the less the acceptance and the higher the interplay of coalitions and informal influences.

The typical pitfall of many OA projects is that overwhelming attention is given to quantifiable matters (technology, data and the like), but little attention is paid to the people and procedures integrating with the technology. When people are ignored, political surprises occur and the OA staff can find themselves naively trapped.

To avoid this political pitfall, the OA staff must assess resistances, commitments and key players.

Assessing resistances: A collaborative relationship with the user is desirable. An involved user rarely criticizes the system he helped build. However, you cannot always create a collaborative relationship on short notice. Then, resistances crop up and politics come into play. One trick in using resistance to your benefit is to anticipate it and turn it into support. For example:

Gerry Hunter, a user manager, opposed office automation. She believed her authority span would be redefined, privileged information would be distributed en masse and she would have to learn to type. To Gerry, these fears translated into lessened authority. Opposition to OA was the easiest route.

The wise OA manager working with Gerry recognized her resistance and pointed out that her political strength would grow through access to more information, that a new authority span would mean new visibility in the company and that learning to use a keyboard would not necessarily mean learning to type 90 words a minute. Finally, the OA manager convinced Gerry that her reputation would be enhanced by the completion of more and better work.

People resist OA for many different reasons:

- Vested interests: "We've built up a good work group and see no reason why we should be asked to change our operations."
- Cultural rigidities: "We do things our way and don't like being told we should change them to suit the ideas of people who have no understanding of our jobs."
- Disagreements about goals and values: "Our priority should be customer service, not cost-cutting."
- Win/lose psychology: "This is a ploy by marketing to get first cut at funds for expansion."
- Territorial threats: "We have always been responsible for coordinating budgets."
- Fear of obsolescence: "What happens to our supervisor's authority when the system takes over?"
- The rumor mill of uncertainty about what will happen: "When they bring consultants in, they're looking to lay people off."
- Rivalries: "We have a lot of trouble getting cooperation from the production department and this system will allow them to . . ."
- Departmental focus on corporate issues: "The job of banking is to manage funds, not to play around with naive ideas of marketing."
- Private attributions of others' motives: "This has to be a back-door approach to getting control by the corporate staff."
- Group cohesiveness leading to general resistance to outsiders: "Those people at corporate . . ."
- Concern for job security and equity: "Why me? How come we have to do this here?"
- Absence of a felt need for the system: "We're doing a good job as it is."

Although many are hard to resolve, all these statements are rational. Resistances may be overt ("I won't have it here!") or covert ("Oh, I didn't understand."). Non-cooperation and other covert responses are seen in groups that have little political power and few formal resources to employ.

Simply ignoring or suppressing resistance is rarely effective. Symptoms may disappear, only to resurface later. Another poor response is to focus on primary users (who use the system directly) while ignoring secondary users (who use the system through a "middleman" or provide input data without receiving benefits). Resistance from secondary users can be just as problematic as primary user resistance.

The effective response to resistance is to view it as a warning signal from users. They may feel the status quo doesn't need to be changed; they may see more to lose than to gain. The ingredients for resolving resistances are authority, communication and negotiation. It also helps when outsiders (the OA staff vis-a-vis the users) can become insiders, creating a climate of trust.

Assessing commitments is also important. Is top management prepared to provide the necessary resources for the project? Is the user group committed? The following list of questions can aid in assessing the commitment of a user group; the more "yes" responses, the higher the commitment.

- Character: Does the organization have a "can-do," innovative personality? Has the group been a quick study in the past? Has its management shown initiative and problem-solving capability in the past?
- Exposure: Does the group have credibility within the company? Will success be visible and recognized? Can its success be used politically?
- Alliances: Does the department have close alliances with other organizations that will be interested in adopting the new approaches after they have been proven?
- Timing: Is the timing right for the department to take on a new, unfamiliar activity.
- Desire: Does the user group want the application? Are the internal politics of the organization favorable toward OA?
- Chances of success: Do they have applications that will prove the technology within a reasonable time? (Quick payoff applications reduce the likelihood of political criticism).
- Measurement: Can the benefits be quantified or otherwise objectively evaluated? Can logical/rational benefits hold negative political concerns at bay?
- Learning: Does the application provide a good learning experience in terms of behavioral, organizational and/or technical issues? Can that learning be transferred to other applications in the organization, reducing negative political actions?

Assessing key players: It is also important to assess the key people necessary for project success. Typically, a few people determine the outcome of the effort. Identify the innovators, early adopters, later adopters, gatekeepers and intermediaries.

- Innovators are independent, ignore norms and push ahead with OA systems. When dramatic change or new technology is involved, innovators are needed. They cooperate with early pilot projects, but may lack the political clout to convince others of the value of an application.
- Early adopters have high political status and credibility. They listen to the innovators, can demonstrate the value of the new tools and can be a missionaries to the organization. They give credibility and visibility to the innovation. Often, early adopters are need-oriented.
- Later adopters are interested in the innovation only when its value is clear. If an innovator or an early adopter is needed in a project and only later adopters are available, keep looking.
- Gatekeepers provide a link between the suppliers of the technology and the potential users. They are good communicators and develop informal channels. Gatekeepers can discover needs and link innovators and early adopters. This role is often performed by the OA group.
- Intermediaries can bridge the gap between headquarters and decentralized divisions. Mediation by intermediaries is important in controlling political moves. Intermediaries might work in the functional area, with technicians reporting to them. Such intermediaries need not be technical experts, but, rather, "smart buyers."

1. Define the issues.
2. Identify the actors.
3. Estimate issue position, power and salience for each actor.
4. Calculate weights for each actor and for whole system.
5. Calculate probabilities.
6. Determine strategies.

Figure 1 — The Prince Political Accounting System

Finally, in assessing key players, don't overlook the benefits of involving a variety of experts (like people from administration or personnel). More than a few OA projects have hit rough political waters simply because someone was forgotten. Even if a group doesn't want to participate, the offer alone might fend off negative political impacts.

Don't ignore politics. Consider up front:

- What is the development's political impact?
- What are the commitments and resistances?
- Who are the key players?
- What are the individual and organizational needs?
- What mechanisms exist or should be created to ensure resolution of differences?
- Is there a senior manager — a fixer — who has the authority and influence to deal with the problems?
- Is there a charter or other document that outlines the OA mission and the OA team's authority?
- Does the system meet local needs, or will it be seen as imposed by outsiders?
- How can change be minimized without sacrificing system goals?
- Can training, briefings and feedback opportunities help alleviate fears?
- How can rumors be dispelled quickly?

One quantifiable method of looking at your political environment is the Prince Political Accounting System. The steps of the system are reviewed in Figure 1 on Page 71. In Figure 2, the system has been applied to a brief example. For more details, further reading is necessary.

☐ Define the issue. The issue should be specific and should begin with an active verb. It should also have significant support and opposition (which poses a political problem).

☐ Identify the actors. Actors are people who should be considered in making the decision or carrying it out.

In our personal computer example (Figure 2), the number of actors was limited for illustration purposes; in real situations the number may be as high as 20.

☐ Estimate the issue position, power and salience for each actor and assign a value to each. Issue position is the attitude of the actor toward the position (value +3 to -3). Power is the degree to which the actor will exert influence, directly or indirectly, in support of or in opposition to the decision (value 1 to 3).

Salience is the importance the actor attaches to supporting or opposing the decision relative to other decisions with which the actor is concerned (value 1 to 3).

☐ Calculate the weights for each actor and for the whole system. Actor weights are multiplied and the system weight is a total of the actor weights.

☐ Calculate probabilities by determining the values shown in the example. Using the values from step four, determine:

A = The added scores of issue position supporters.

B = The added absolute value scores of actors opposing the issue.

C = The scores of actors with an issue position of zero.

D = The total of A + B + C.

E = The total of A + 1/2C

Probability of support = E/D

☐ To determine strategies, consider whether you want a higher or lower probability. Then, determine your strategy, such as:

- Compromise. Get the most important components of what you want and make the opposition as happy as possible.
- Stimulate actors not currently involved to become interested or powerful.
- Change the position of actors to agree with your position through arguments, promises, threats, friendships and so on.
- Raise salience by distributing information or creating publicity.
- Lower salience by avoiding publicity or directing attention to another issue.

Politics is real. Although its effects may appear crazy on the surface, the reasons behind political actions are understandable. Because OA systems usually imply change, politics thrives in the OA environment.

Through proper assessment and strategy building, however, negative political influences can be conquered. OA

Barnes is a senior product developer for Deltak, Inc. Her specialties include integrating data processing and word processing and user responsibility in information management. She is completing an MBA at the University of Phoenix.

1. Implement a personal computer network among top managers.
2. Actors: company president, MIS director, two user vice-presidents.
3. Issue Position:

President	0	(neutral)
MIS director	+3	(supports implementation).
User VP1	-1	(slightly against implementation).
User VP2	-3	(strongly against implementation).

Power:

President	2	(moderate power).
MIS director	3	(substantial power).
User VP1	1	(slight power).
User VP2	3	(substantial power).

Salience:

President	1	(slight concern).
MIS director	3	(high priority).
User VP1	1	(slight concern).
User VP2	2	(moderate priority).

4.

President	(2)	(0x2x2)
MIS director	27	(multiply each weight).
User VP1	-1	(multiply each weight).
User VP2	-18	(multiply each weight)
Total Weights	10	(add all numbers in Step 4).

5. A = 27 (Added scores of Issue Position supporters).
   B = 19 (Added absolute value of actors opposing issue).
   C = 2 (Scores of actors with Issue Position of zero).
   D = 48 (Total A+B+C).
   E = 28 (Total A+1/2C).
   Probability of support $= \frac{E}{D} = \frac{28}{48} = .58$ (58%)
6. Strategies.

Based on *Everyman's Prince: A Guide to Understanding Your Political Problems*, by William D. Coplin and Michael K. O'Leary, 2nd. ed., North Scituate, Mass., Duxbury Press, 1976.

Figure 2. Prince Political Accounting System Example

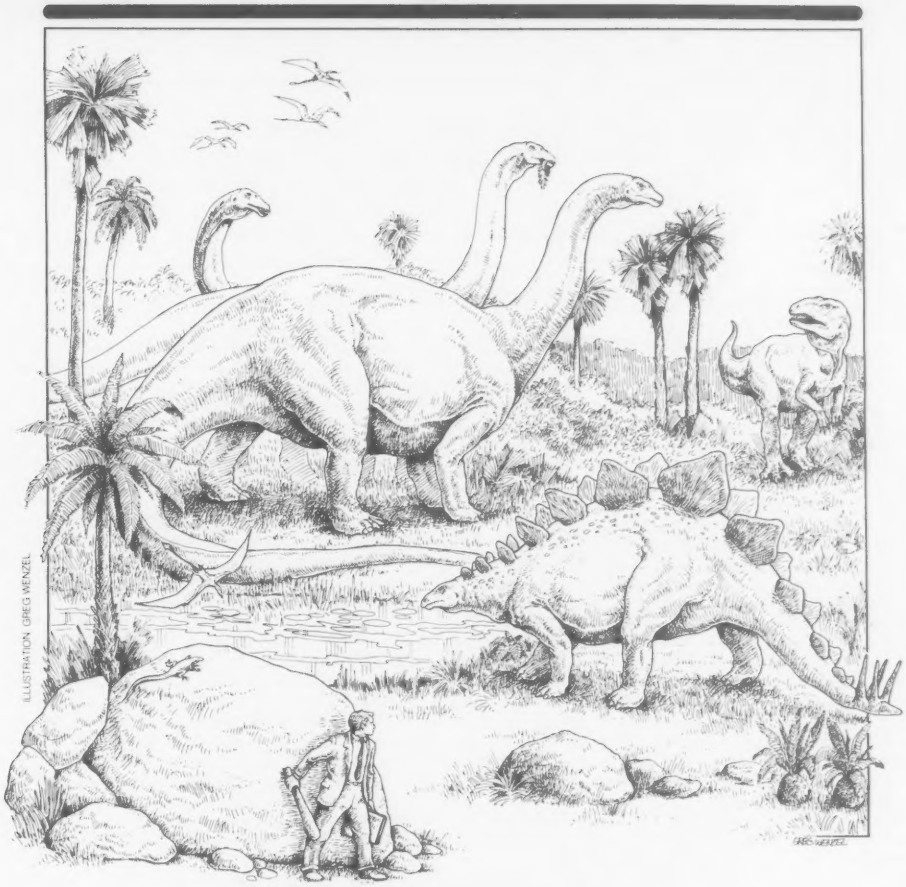

ILLUSTRATION: GREG MENZEL

Change Is Inevitable

Mired in out-of-date equipment and procedures? Your staff and management may not make it easy to get rid of those dinosaurs.

By Philip J. Berg

If we examine today's office, it is evident that many individuals and organizations are mired in the past. Outstanding new technology is available for both hardware and software, yet there is a reluctance to upgrade the environment and to take advantage of the new technologies. This reluctance stems from two basic sources — individual attitudes and organizational philosophies.

In speaking with a wide cross-section of people at many different companies, one encounters a number of interesting comments about office automation:

"I can't use a terminal." At a time when computer-based technology touches almost every aspect of our lives, many people are still afraid of computer terminals. However, anyone who has ever tried the hunt-and-peck technique of typing should be able to use a computer terminal. In fact, some computer-based office telephone systems are more difficult to use than a terminal. Even those rare individuals who have no keyboard experience at all should be able to master this skill in a few hours — if their mental blocks can be overcome.

Certainly, this fear will gradually disappear now that schoolchildren

see and use computers on a regular basis. But can office automation wait until these new generations of computer-literate children have completely replaced the older generations of office personnel?

"Only technicians use terminals." Some within the business community look upon terminal use as degrading, or at least not for them. However, many believe the terminal must become as much an integral part of the office environment as the telephone. The negative attitude toward terminals is especially harmful toward electronic mail, because it can succeed only if virtually everyone in the organization uses it.

Fortunately, some electronic mail systems offer features that allow mail-handling (and terminal use) to be delegated to secretaries, administrative assistants and so on. Such measures can help ensure that even the terminal-phobic will have access to electronic mail correspondence.

"I have to have hard copy." Maybe we are all a little reluctant to part with hard copy. After all, a feeling of security is generated by being able to hold something tangible in our hands. (This dependency is sometimes carried to an extreme. Too many organizations mandate 10 copies of everything as company policy.) However, hard copy is more often a security blanket than something truly necessary. A letter is as easily viewed on a terminal as it is on paper.

The real problem with paper is that, in large quantities, it becomes unmanageable. If someone has piles and piles of paper on his desk and claims he can reach into any pile and pull out what he needs, one has to wonder whether it is true or simply a rationalization. One also has to wonder if it is better to have these paper stacks than to have ordered, sorted lists on a terminal screen. Computers are capable of storing large amounts of information and of easily indexing them for convenient access. Why should every individual in a company be burdened with that job as a manual task?

Certainly there are times when hard copy is required. Good electronic mail systems will produce hard copy when necessary. After all, a primary goal of electronic mail is the reduction of hard-copy use and soaring paper costs.

"I don't want to have to sign onto a terminal." This is perhaps the most difficult attitude to overcome. Those who are not willing to sign on to the system frustrate those who send them information. Eventually, this may have a domino effect and discourage previously satisfied users from communicating electronically.

Naturally, methods exist to combat this attitude — convenient placement of terminals, user education and, if all else fails, even a corporate mandate. It is also helpful to impress upon these resistors that the average user can handle his mail in 15 to 20 minutes daily with an electronic system. This is a far shorter period of time than is normally spent when paper, dictation, typing, manual filing and copying are parts of the process.

"Individual attitudes that impede office automation can often be overcome by a strong management directive. However, when the real difficulty lies with the organization's philosophy, the move forward goes even more slowly."

Technological reluctance can also be overcome if advocates of electronic mail promote its use, even to the extent of refusing to send nonelectronic messages. This forces nonusers gradually, but subtly, at least to attempt to use the system. There is, after all, a natural curiosity in all of us, especially where mail is concerned.

Individual attitudes that impede office automation can often be overcome by a strong management directive. However, when the real difficulty lies with the organization's philosophy, the move forward goes even more slowly. Among the more frequently stated organizational objections are comments such as:

"Our organization does not have enough correspondence." Few companies have ever analyzed their internal message traffic thoroughly. In fact, the methods used to disseminate mail and to conduct intercompany communication make it difficult to assess the volume of communication accurately. With traditional methods, one can only wonder how often mail is lost or not sent at all, for one reason or another. Judging from paper purchases and the use of reproduction facilities, many businesses appear to be drowning in paper.

"We prefer to keep our operation decentralized." Organizational opinions divide on the issue of centralization vs. decentralization. Historically, departments have often been autonomous in relation to such areas as equipment purchases. As a consequence, many companies are overrun with many totally different word processors. Although these word processors accelerated the production of written material, they rarely improved communications because different brands of word processor are rarely able to talk to one another. Improved communication is, after all, a primary OA goal. Installing large quantities of incompatible equipment hasn't accomplished too much.

Obviously, good communication can occur only when the participants in the dialogue are somehow linked. Telecommunications, coupled with a good electronic mail system, offers the opportunity to interconnect all individuals in a company, and, thus, to provide an open channel for communication. But to work properly, the approach must be centralized so that any one department can make contact with any other. If the approach is decentralized, it may improve intradepartmental communication, but certainly not interdepartmental activity. Someone still has to walk the paper from one department to another.

"Electronic mail is not compatible with our existing procedures." Inertia is compelling. In many businesses, the way things are done is the way they will be done for years to come. "We've always done it this way," is a common rationale.

One prerequisite of the automated office is a thorough review of existing business procedures. Are there good reasons for the way things are currently done? Can some procedures be improved with new methodologies? Real improvement is possible only if an organization is willing to examine its current office and business practices with total honesty. These examinations will almost always identify many areas that could be improved substantially and will expose potential benefits of OA.

"We have to establish a committee to decide." Committees often lose sight of their charters. Instead of performing a thorough analysis of an organization's requirements, committee workings sometimes deteriorate into personality conflicts and clashes over personal preferences. Certainly, no decisions on OA should occur without suggestions and opinions from all part of the organization. Yet conventional committees are not the answer.

"The need for office automation exists within most companies. The real issue should be how to judge a good system, how to incorporate it into the work flow without disruption and how to manage it when it is in place."

The alternative is an advisory committee, which merely presents its findings and a summary of the organization's requirements, but does not offer specific conclusions. A unilateral decision can then be made by someone at a much higher level. This avoids evaluations which become clouded by interdepartmental rivalries.

"We are not sure we are ready for OA." What constitutes readiness for OA? Surely not the lack of technology, most of which is already available. In many cases, not being ready is analogous to being afraid of the new technology — afraid of upheaval, of unexpected implications and of the unknown.

The need for OA exists within most companies. The real issue should be how to judge a good system, how to incorporate it into the work flow without disruption and how to manage it when it is in place. The sooner organizations begin to move in this direction, the sooner they will begin to solve the myriad number of problems that exist in today's office.

Yet there are potential pitfalls in the move toward office automation. Not all companies that produce OA products offer complete solutions. Some may produce a single product — one that represents only a small part of the total solution — and then divert their efforts to other areas. In selecting a vendor, whether for hardware or software, the purchaser should be certain that vendor has a real long-term commitment to OA. And if the company expects to acquire a variety of products, all must be integrated to work together effectively.

"We can't afford it." It is not inexpensive to implement an automated office. At the same time, there are enormous potential financial benefits, some of which are not immediately realizable.

Any serious economic analysis must examine all factors carefully. Tangible savings — those of paper, equipment, postage and telephone — are measurable with some effort. The intangible ones, like the value of timely communication, improved morale and time savings, are more difficult to assess, but they are not less important. If all factors are brought into the equation, most organizations will discover they cannot afford not to automate.

Overcoming negative attitudes and philosophies is not easy. It would be easier to wait for the entire office work force to achieve a level of computer literacy, but businesses may suffocate under mountains of paper before this happens. Negative influences can be combatted. Organizations should take every opportunity to educate employees in the benefits of a modern approach. Often, simply exposing people to these technologies goes a long way toward overcoming reluctance, especially when the new system is user-friendly.

Nor can the financial aspect be overemphasized. Office automation is in the best financial interest of the corporation, a point that certainly should not be lost on corporate management. For individuals working at lower levels within the organization, where job boredom is often a serious problem, the opportunity to use new technologies can be stimulating and can minimize that boredom and drudgery.

The difficulty of overcoming negative attitudes should not be underestimated. Nevertheless, it is essential that organizations undertake the effort if they are to reap the substantial benefits that OA can bring. OA

Berg is a vice-president of Applied Data Research, Inc. in Princeton, N.J. and is responsible for several OA projects at ADR, including electronic mail, WP and decision support.

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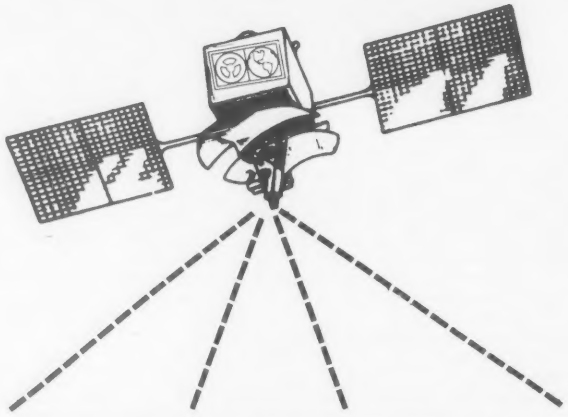

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OA

So many questions crop up when you automate: Wait or jump in now? What equipment? Lease or buy?

Decisions Decisions

By Thomas R. Mylott III

Some companies are as eager to select from among the available office automation options as they would be to ramble along a poorly marked path through a mine field. A confusing matrix of alternatives confronts those who think about leasing or buying OA goods and services. By systematically answering some preliminary questions, however, present and potential OA users can keep both the forest and the trees of options in focus. In evaluating alternatives, the OA user may find that the difficulty in obtaining answers is the result of not knowing the preliminary questions.

A primary question involves which general category of OA goods and services the OA user should select. A user can follow any of four paths to office automation:

- Acquisition of single-function OA equipment.
- Software and hardware supplements to mainframe or minicomputer systems.
- Personal computer systems.
- Connection to a network.

Single-function OA equipment is usually a combination of hardware and software dedicated to a specific OA function such as word processing. In many ways, this choice presents the easiest solution for the prospective user. Manufacturers of OA equipment design it with the needs of the office in mind. Keyboards, for instance, will be laid out well. Vendor training focuses on personnel with the experience and level of skill customarily found in the office. Those who offer OA equipment

have specifically targeted office automation as their market.

However, few standards exist in OA equipment technology. One vendor's storage media will rarely function on another vendor's machine. Training for one type of word processor is of minimal use on a competing model. As a result, unless a user wants to create its own OA Tower of Babel, the incentive is to commit to one vendor's technology. After that commitment is made, any change is likely to involve not only substantial retraining, but also translating data from the previous storage media to the new media. Moreover, since much OA equipment is single-function, a need for additional OA functions will force a user to acquire a new technology or more OA equipment.

The alternative of supplementing an existing computer system with OA hardware and software presumes, of course, that the user has an existing computer system.

If a mainframe or minicomputer system is available, the OA user will often use the central computer resources of the company and be one more user among many others. For an OA user to be able to use a centralized computer system most effectively, the mainframe or minicomputer system must be configured to permit some type of on-line or time-sharing processing. Batch runs are not well-suited to OA applications. Moreover, the control over hardware and software in such an operation will almost never rest with the OA user, but rather will reside with those who control the DP function within the company, usually a DP department.

This lack of control is an important consideration. The OA user is likely to be competing for the computer system resources, such as machine time and data storage. If for some reason payroll, inventory or some month-end processing task needs those resources, the OA applications are likely to be the first passengers bumped.

The OA user will also be vulnerable to whatever the centralized system is vulnerable to. When the system goes down, the OA applications go down with it. Along with losing control over the processing aspect of the OA applications, the OA user is also likely to lose control over the data itself. Without a centralized system, users have the option of storing their data at their own workstations and in their own departments, but in a centralized system, the data storage is also likely to be centralized. Centralization of data presents problems of security, control and integrity of data which are different from those of dispersed storage. When users cannot control their data, they often must adjust to forms and formats not necessarily suitable for their needs.

Small general-purpose computers known as personal computers offer the OA user a tantalizing alternative. Most hardware and software in the personal computer range is quite inexpensive. Some hardware is so portable its user can literally lock it up like a briefcase and place it under an airplane seat. Several portable models are now on the market.

Low cost and flexibility are the major attractions of personal computers. They can perform both OA and other functions, such as spreadsheet analysis and electronic filing. Hundreds of software packages are available for non-OA functions.

A personal computer allows the user to customize data. Increasingly, users can, with little difficulty, transport personal computer software and data from one manufacturer's machine to that of another. For some personal computers, more than one version of an application is available. For example, several different WP programs are available for the more popular models.

One major obstacle to the use of personal computers for OA is that few are specifically designed for the office. Keyboards are often poorly arranged; video screen designs often do nothing to reduce eyestrain. The training available for using personal computers most often consists of a manual that tries to train those who will train themselves. However, some personal computer software applications are so well designed that learning to use them is easy.

Many network alternatives are available for consideration. The general principle of a network is the ability of workstations to communicate with other equipment in some manner. A network could consist of OA equipment, personal computers or existing centralized computer systems, connected to each other in many different combinations. A technology now emerging is a network in which personal computers are interconnected with or without a centralized (host) computer system. Several personal computers are already able to communicate with mainframe and minicomputers. A network allows the user to maintain the advantages of using OA equipment or personal computers and provides the means for new OA applications such as electronic mail.

After deciding which of the acquisition alternatives to pursue, the OA user must then decide whether to buy now or wait until the price falls or the power of the equipment increases. The rapid pace of technological change has led to a dramatic decline in prices and an increase in power and capacity of computer equipment. Software also costs less now than it did in the past. With the decline in software and hardware prices has come a proliferation of alternatives, and selection has accordingly become more difficult. At the same time, however, the possibility of finding suitable hardware and software has increased.

"Many users who have recently acquired systems are haunted by the possibility of a substantial decrease in price or a quantum leap in performance of systems on the market. Nevertheless, hesitation out of fear of committing to a technology is misplaced. Users should also analyze the costs of failing to increase their present office productivity."

The pace of change also means current technology is becoming obsolete far more quickly than before. Many users who have recently acquired systems are haunted by the possibility of a substantial decrease in price or a quantum leap in performance of systems on the market. Nevertheless, hesitation out of fear of committing to a technology is misplaced. In addition to weighing the costs of having purchased a system that may become obsolete, users should also analyze the costs of failing to increase their present office productivity.

Another way of deciding whether to buy or wait is to assess the functions for which the equipment could now be used and to contrast them with the improvements in price or performance the future might offer. If the equipment will be sufficient and cost-effective for the tasks at the present time, the possibility that there will be a better alternative in the future may not matter. The pocket calculator of 10 years ago is just as useful for arithmetic as is the 1983 version. Moreover, while the pace and character of technological change is entirely speculative, a user can obtain immediate savings and increased productivity from equipment now available.

Finally, technical obsolescence has two faces. Equipment can be totally unable to function with new technology; the old hand-cranked telephones will not function with present telephone networks. However, equipment can be a prior generation of technology. Although it may no longer offer a purchaser the optimum performance for the price, it might still perform satisfactorily. Rotary-dial telephones are common and perform well despite the introduction of tone-generating telephones. Careful selection of a technology in widespread use is unlikely to leave the OA user stranded when that technology changes.

Having decided to make an acquisition, a user will have to choose between purchasing or leasing. The decision to lease or buy is a decision about hardware, not software. Software is usually distributed under a license, which is a legal concept distinct from leasing or buying. There are two basic categories of leases: full payout and operating.

The full payout lease has the following characteristics:

- It is usually long term.
- The sum of the rental payments is approximately equal to the purchase price of the equipment.
- The responsibilities of ownership usually reside with the user (lessee).

The operating lease differs in that:

- It is usually short term.
- The sum of the rental payments is less than the purchase price of the equipment.

Rental payments in a full payout lease are often lower than in an operating lease. If a full payout lease provides the lessee with an option to purchase the equipment at less than market value, then the lease can be viewed as an installment purchase.

The two basic methods of financing a lease are through a nonleveraged lease or a leveraged lease. In the nonleveraged lease (also known as a straight or direct lease), the owner (lessor) has acquired the equipment with its own funds. Only the lessor-owner and the lessee-user are involved.

In a leveraged lease, a third party loans the lessor a substantial amount of the money necessary to acquire the equipment. The lessor-owner, lessee-user and lender are all involved in a leveraged lease.

Sometimes the decision to buy or lease is a question of the user's ability to obtain financing for a purchase. The cost of money and the lease rates available will influence the user's ability to purchase.

The decision to lease or buy is also dependent in part on the income tax consequences of the decision. If the OA user leases hardware, he can usually deduct from taxable income all of the lease payments during the year. This means that lessee-users can reduce their taxable income by the same amount they actually spent on the equipment.

However, users who purchase

can generally deduct only a portion of the purchase price from their income; they must depreciate the equipment. Purchasers cannot reduce their taxable income by the same amount they actually paid for the hardware in the year they paid it. However, the tax laws do allow purchasers a bonus, the investment tax credit (ITC). ITC is calculated as a percentage of the purchase price which the purchaser may subtract, not from taxable income, but from taxes actually owed.

The decision to lease or buy could therefore depend on the tax situation of the user. The tax implications can be quite complicated. Recent changes to the tax laws have added new wrinkles to the buy-or-lease decision. Before making a final decision, a user should obtain professional legal and accounting advice.

A lease can also be a hedge against obsolescence. Users who do not own hardware are not stuck with it when the technology advances. Of course, this is not necessarily true in a full payout lease — particularly one with an option to purchase at a nominal price. In any lease, the user will still have to pay the rent for the full term, and a long-term lease means many payments. Lessors who lease equipment for short periods of time estimate the market value that equipment will have at the end of the lease. If the technology advances, the market value of the equipment normally declines. If the lessor has overestimated the future market value, the transaction will have unprofitable consequences for the lessor. As a result, the rental rates in a short-term lease will likely be high if the lessor is worried about the equipment becoming obsolete.

"The user who has an obsolete technology on order is in a much worse situation than one who acquired a technology that later became obsolete."

In any acquisition, many legal issues should be considered, and users should obtain legal advice before signing anything. In OA acquisitions, two important legal issues are frequently underestimated: The effect delay in delivery will have on the procurement, and the relationship between multiple computer purchases and software.

There is usually little delay involved in the purchase of personal computer systems. Users can purchase systems literally right off the shelf at a computer store. Other equipment and volume purchases of personal computers freqently result in a waiting period between ordering and delivery. When confronted with a possibility of delay beyond the expected delivery, a user must carefully evaluate the delay's impact in advance.

Delays are not uncommon and they vary according to vendor and equipment. A delay of several months may not seem like a long time, but in terms of advances in computer technology, especially at the personal computer level, a few months could make a great difference in what the market offers. The user who has an obsolete technology on order is in a much worse situation than one who acquired a technology that later became obsolete. In most contracts for computer hardware, failure to deliver on time is not a breach of contract. If the consequence of a delay in delivery will be serious, the OA user must ensure that the contract provides a remedy for the user in the event of such delay.

The other often-neglected legal concern occurs when an OA user purchases multiple computers or moves software from one machine to another. Many software licenses prohibit using one copy of software on more than one machine. Some prohibit sharing one machine's software resources with other machines even if the software itself is never transferred. The OA user must carefully examine all software licenses and negotiate changes for those that are not appropriate for the software's intended use.

Finding answers to the preliminary questions raised here will suggest subsequent lines of inquiry. The answer to one question is likely to remain unchanged: the cost of failing to use OA technology to improve office productivity will increase while the cost of OA technology will decrease. ♦ OA

Mylott, an attorney with the Dallas law firm of Peter S. Vogel, P.C., has been involved with computers for over 15 years and hold a Certificate in Data Processing.

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Read the next issue of COMPUTERWORLD OA OFFICE AUTOMATION

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TECHNOLOGY

Apple Computer, Inc. introduced a 16-bit microcomputer that reportedly allows several applications to be run simultaneously. Known as Lisa, the system is aimed at the professional and executive OA market. Six integrated application software packages that reside in a 5M-byte hard-disk

Apple Computer, Inc.'s Lisa

system include an electronic spread sheet, word processing, two business graphics packages, a data base facility and a project management package.

Several documents can be displayed on the system's 12-in screen simultaneously, and users can switch at will from one package to another without having to swap floppy diskettes, Apple said. Users can also pass data back and forth with the use of a "mouse."

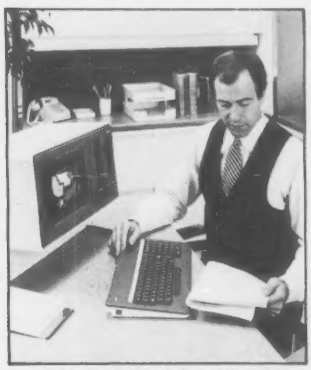
Built around a Motorola Corp. MC68000 microprocessor, a standard package with 1M byte of main memory and two 5¼-in floppy disk units, a 5M-byte hard-disk unit, six programs and a display screen with keyboard, costs $9,995. Shipments are scheduled for spring.

The firm also announced the Apple IIE, an enhanced version of the existing Apple II, costing $1,395.

In addition, Apple is offering a hardware/software interface said to allow Apple personal computers to communicate with IBM mainframes. The 3270 cluster controller emulator will imitate IBM terminal functions, enabling Apple users to perform on-line data entry, inquiry and response, electronic mail, remote data base access and program development, Apple claimed. The device will be available in a System Network Architecture/Synchronous Data Link control version that emulates the IBM 3276 Control Unit Display Station and a binary synchronous communications version that emulates the IBM 3271 Cluster Controller.

Priced at $1,000/port, the product is slated to be available in mid-1983. Apple is based at 20525 Mariani Ave., Cupertino, Calif. 95014.

Two microcomputers and a local-area network that links the systems with the IBM Personal Computer and Apple Computer, Inc.'s Apple II were unveiled by **NCR Corp.** The systems on the Decision Mate V series include an 8-bit Zilog, Inc. Z80A-based system and an 8/16-bit Z80A and Intel Corp. 8088-based system. Both run under the Digital Research, Inc. CP/M and Microsoft, Inc. MS-DOS operating sytems. External



The NCR Decision Mate V

plugs permit users to add subsystems (including a diagnostic module that locates faults) to the units' backplanes.

The 8-bit system's basic configuration consists of two 512K-byte floppy disk drives, 64K bytes of main memory, a 12-in. CRT, detachable keyboard, an operating system and a bit-map graphics subsystem that contains its own processor and memory for $2,800. The 8/16 system costs $3,340 and has an added 8088 chip. The Decison Net local-area network supports up to 63 users simultaneously and costs $500 per connection. NCR is at 1700 S. Patterson Blvd., Dayton, Ohio 45479.

A new generation of personal computer software which will reportedly let any personal computer user work with a variety of application products at one time has been announced by **Visicorp**. With VisiOn, applications are displayed on a screen that corresponds, visually and dynamically, to a business professional's desktop, according to the vendor. This product is reportedly hardware and operating system independent and takes just 30 minutes to learn.

The initial product offering, slated for this summer, will include spreadsheet, word processing, data base management and graphics. Pricing is not yet available. The vendor is located at 2895 Zanker Road, San Jose, Calif. 95134.

The Philips 3004

A stand-alone word processing system that combines WP and DP capabilities has been announced by **Philips Information Systems, Inc.** The Series 3000 features console, detachable keyboard, dual 5¼-in. diskette drives and a letter-quality printer for $9,900.

The vendor also announced an office mail system called the Information Management Facility, which reportedly provides a means of sharing information among users of Philips' computers. This software is priced from $45,900.

Philips is at 4040 McEwen, Dallas, Texas 75234.

Sord Computer Systems, Inc. of Japan unveiled its first series of microcomputers to the U.S. recently under the Socius brand name. The company's product line includes the Socius M23P, an 8-bit lightweight machine with 128K bytes of memory ($2,595); a Zilog, Inc. Z80A-based desktop

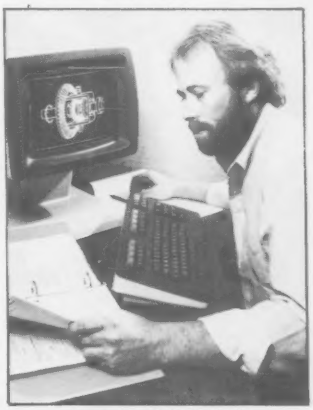
Sord's M343

business computer called M23 Mark III, which also has 128K bytes of memory ($2,695); the M23 Mark V, with the capabilities of the Mark III plus two IBM-compatible 8-in. floppy disk drives for increased storage capacity ($3,495).

Also announced were the 16-bit M343 system, which includes an Intel Corp. 8086 microprocessor and 256K bytes of memory and which can use either hard or floppy disk storage systems, according to the vendor ($6,000). Finally, a home computer was also announced, the M5 ($247). Further details are available from the vendor at 200 Park Ave., New York, N.Y. 10166.

Hewlett-Packard Co. has introduced the HP 2627A color graphics terminal featuring vector graphics and alphanumeric capabilities in a compact package. This product is intended for business and technical graphics, weighs 50 lbs and offers eight basic colors that can reportedly be mixed. It costs $5,975.

The vendor also announced two software packages: the Personal Productivity Pac ($250) and Peachtree's Series 8 Accounting Peach Pak ($1,500), which offer a



HP's Model 2627A

large number of office capabilities.

HP can be reached for further details at 1820 Embarcadero Road, Palo Alto, Calif. 94303.

American Bell, Inc.'s Advanced Information Systems Division unveiled the Dimension AIS/System 85, and a series of AIS/System 85-compatible terminals. The 300- to 900-line, 19.2K bit/sec digital PBX features voice, data, office and building management applications. The System 85 is an enhanced version of earlier Dimension models, which featured only analog transmission. Available by mid-'83, on a lease-only basis, the PBX, also known as "Antelope," runs over twisted-pair wiring at potential speeds of up to 64K bit/sec., the firm said.

An average 600-line configuration will cost $12,500/mo on a lease basis. The 7000 series terminals are available under lease or purchase terms with price ranges from $735 to $1,500, and $5.50 to $21 when leased.

North Star Computers, Inc. has unveiled a software package that reportedly provides a 2780/

3780 bisynchronous communications link between North Star microcomputers and large mainframes and minicomputers. The Northlink 2780/3780 Bisync is priced at $499.

The vendor also introduced a graphics package intended for the small business market. Called the North Star Graphics Family, this software features split-screen capabilities and a number of graphics formats and functions. It runs under the vendor's version of Digital Research, Inc.'s CP/M operating system. The bundled version of the graphics family costs $799, but is available in modules. North Star is based at 14440 Catalina St., San Leandro, Calif. 94577.

A local-area network product line that runs over coaxial able in a "twin ring" has been unveiled by **Racal-Milgo, Inc.** The Planet Token Ring series can reportedly be configured to meet a number of application specifications and can accommodate up to 500 communicating devices, according to the vendor. The communications link is controlled by the Planet Director, a desktop intelligent network processor; system interface is provided by Terminal Access Points. These items sell for $9,450 and $2,250 respectively. Racal Milgo is at 8600 NW 41 St., P.O. Box 520399, Miami, Fla. 33152.

A family of dual-processor-based desktop microcomputers featuring 8/16-bit technology has been introduced by **Compupro Systems**. The System 816 series is configured around an Intel Corp. 8085/8088 CPU and offers capabilities ranging from a single-user workstation to a high-performance multiuser system supporting users under Compupro's proprietary MP/M 8-16 operating system.

according to the vendor. Prices for this system start at $5,495. Further details can be obtained from Compupro at Oakland Airport, Calif. 94614.

A 16-bit microcomputer offering a Zilog, Inc. Z80A microprocessor along with either an Intel Corp. 8086 or a Motorola, Inc. 68000 processor has been unveiled by **Datamac Computer Systems**. The Series 1600 can operate under a number of popular operating systems, and features Intel's Multibus, allowing configurations from a small three-card system to a large seven-card system, the vendor said.

Other features include Help keys, 12 programmable function keys, CRT screen controls, an 8-MHz processor and a firmware-based Systems Activity Monitor that reportedly enables local and remote users to display and alter memory. Prices for this system range from $3,300 to $8,000, Datamac said from 680 Almanor Ave., Sunnyvale, Calif. 94086.

Digital Equipment Corp. has introduced software and hardware enhancements for its Professional 300 series line of personal microcomputers. The software offerings include a word processing package ($295), IBM communications capabilities featuring bisynchronous and Systems Network Architecture-compatible emulators ($595). Also announced were Professional Tool Kit versions of Cobol, Dibol and Pascal software languages, priced at $2,300.

The hardware included a Digital Research, Inc. CP/M option for $695; an upgrade kit for the firm's Professional 325 to 350, priced at $2,300; and a 256K-byte memory add-on option that enables a system to expand up to 1M byte of memory, for $795.

The company has also reportedly expanded its All-In-1 office system product line with more memory and greater resources. Based on the company's latest disk products, the RA81 fixed-medium drive and the RA60 removable-drive, this system is configured around DEC's VAX-11/750 or VAX-780 processors, a DEC magnetic tape drive, 3M to 4M bytes of memory, software and up to 40 communications lines. Prices range from $168,300 to $318,600, DEC said from Maynard, Mass. 01754.

Wang Laboratories, Inc. has unveiled a smaller, a larger and an expanded version of its Wangnet broadband local-area network. Wangnet cable kits will offer a reduced-scale turnkey networking configuration, while the span for the larger Wangnet configurations has been expanded to service multibuilding environments, Wang said. Also, the number of channels used to support non-Wang systems and terminal attachments has been increased. Kits vary in cost from $1,350 to $10,000, the vendor said from 1 Industrial Ave., Lowell, Mass. 01851.

Rolm Corp. has unveiled Phonemail, a voice mail system for use on its CBX private branch exchange (PBX) that reportedly combines the capabilities of telephone answering, message notification and voice store-and-forward into one integrated package. It consists of an application processor tied to the CBX, and messages are stored on Winchester disks. Users can reportedly call the system day or night for messages.

Available in various configurations, hardware costs start at $50,000. Software may be licensed on a monthly basis for $600, or purchased for $20,000. Further details are available from Rolm at 4900 Old Ironsides Drive, Santa Clara, Calif. 95050.

3M Corp. has announced an electronic mail system for turnkey, stand-alone use in medium-volume business operations. The Whisper Electronic Message Exchange handles messages, sales and service orders, according to the vendor. Rental fees for this product start at $1,500/month. 3M said from Department BC82-18, P.O. Box 33600, St. Paul, Minn. 55133.

CALENDAR

Feb. 24-26, Los Angeles — **Word Processing Supervision Workshop.** Also New York, April 21-23. Contact: Dept. PR, National Institute for Management Research Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Feb. 27-March 4, Oak Brook, Ill. — **DP Training Managers' Workshop.** Also Dallas, April 10-15, and San Francisco, April 24-29. Contact: Deltak, Inc., East-West Technological Center, 1751 West Diehl Road, Naperville, Ill. 60566.

Feb. 28, New York — **Office Automation: Implementation.** Also Los Angeles, March 14; Boston, March 21; Denver, April 4; Chicago, April 25; Houston, April 26. Contact: Digital Equipment Corp. Educational Services, Seminar Programs, 12 Crosby Drive, BUO/E58, Bedford, Mass. 01730.

March 2-4, Los Angeles — **SNA and Teleprocessing Access Methods.** Also Boston, March 9-11 and Dallas, March 28-30. Contact: Center for Advanced Professional Education, Inc., 11928 N. Earlham, Orange, Calif. 92669.

March 3-4, Hartford, Conn. — **Introduction to Teleprocessing.** Contact: Seminar Administrator, NHC Resource Center, New Hampshire College, 2500 N. River Road, Manchester, N.H. 03104.

March 4-5, Providence, R.I. — **Conference on Computer Technology: The Challenge to Business and Industry.** Contact: Registration Office, Aiesec, Box 1930, Providence, R.I. 02912.

March 7-8, Houston — **Office Automation: Strategies.** Also Philadelphia, March 15-16; Detroit, March 28-29; San Francisco, April 11-12; Washington, D.C., April 19-20. Contact: Digital Equipment Corp. Educational Services, Seminar Programs, 12 Crosby Drive, BUO/E58, Bedford, Mass. 01730.

March 8-9, Austin, Texas — **Association for Computing Machinery Sigcomm '83: Symposium on Communications Architecture and Protocols.** Contact: Rebecca Hutchings, Honeywell/FSD, 7900 Westpark Drive, McLean, Va. 22102.

March 9-10, New York — **The New Local Telecommunications Business: Linking the Office to the World.** Contact: Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960.

March 9-11, Baltimore — **Design and Management of Local-Area Networks.** Also Tampa, Fla., March 16-18; Dallas, March 23-25; Columbus, Ohio, March 28-30; New York, April 4-6; Los Angeles, April 13-15; and Boston, April 20-22. Contact: Center for Advanced Professional Education, Inc., 11928 N. Earlham, Orange, Calif. 92669.

March 14-17, Washington, D.C. — **Seventh Annual Federal Office Systems Expo.** Contact: National Trade Productions, Inc., 9418 Annapolis Road, Lanham, Md. 20706.

March 14-18, Boston — **Financial Modeling — A Structured Approach.** Contact: Yourdon, Inc., 1133 Avenue of the Americas, New York, N.Y. 10036.

April 11-14, Philadelphia — **National Micrographics Association 32nd Annual Conference and Exposition.** Contact: NMA, 8719 Colesville Road, Silver Spring, Md. 20910.

April 19-20, New York — **Word Processing Implementation Workshop.** Contact: Department PR, National Institute for Management Research Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

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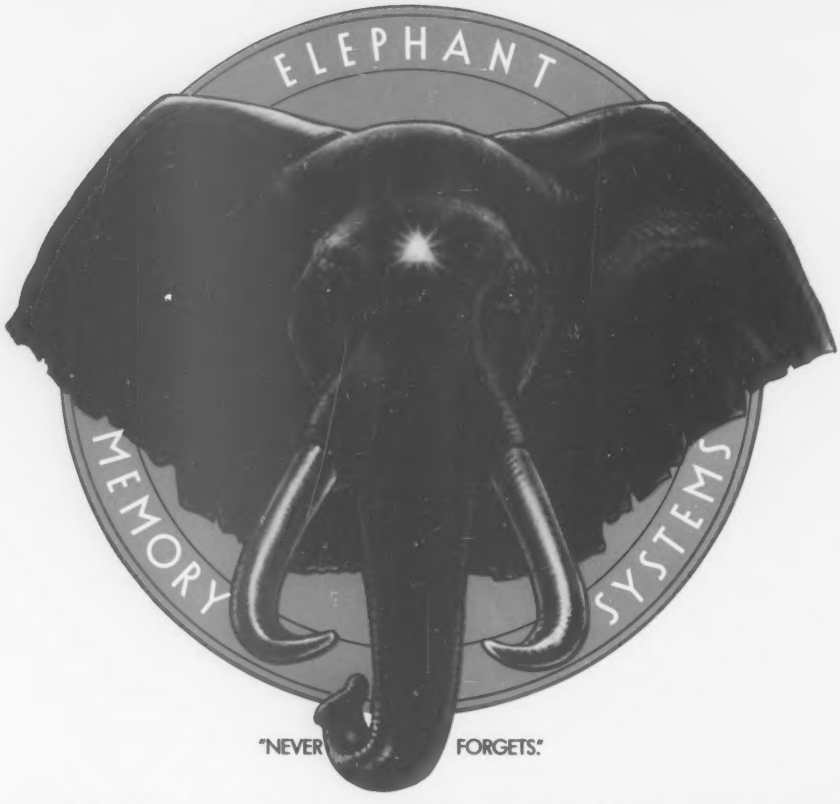

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